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JOURNAL OF Home Economics

RESEARCH ISSUE

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LET'S TALK SHOP

by Kay Kellogg

We discover a great new high-protein food

The intent lady in the above picture is reading the most nutritious cereal story of our time. I'm using some of the space usually reserved for sending in suggestions because I think *you'll* want to know more about this important story, too.

Special K, perhaps the greatest achievement in our 50-year history, is a concentrated high-protein food in a delicious new ready-to-eat cereal form. *It contains more high-quality protein than any other leading cereal—hot or cold. Twice their average!*

For the past four years, we at Kellogg's have been working hand in hand with two great universities to discover how to combine the nourishing grains and other natural foods including milk and yeast. The nutrition departments of these two universities also specified what vitamins and minerals most people needed most and we put them into Special K.

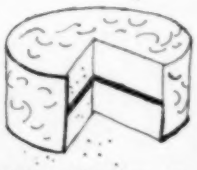
You may be interested in knowing what happened when we sent this new high-protein cereal out in a plain package to several thousand people whose opinions we value—people just like you. For example, one food editor told us: "It's amazing that a cereal with so much solid nourishment could be so light and tasty."

Special K is more than a flake, more than a puff, it's an entirely new form of cereal that even *feels* better in your mouth.

So it's not surprising that everybody who sampled Special K commented on how much they liked the *taste.*

If you would like additional information about Special K, I would like to send you our new eye-opening booklet, "*Common-sense Nutrition and Special K.*" Free, of course. Just write me c/o "Let's Talk Shop", Kellogg Company, Battle Creek, Michigan.

I invite you and your students—particularly the ones who have not been eating cereals too frequently—to try Special K. It's at most grocer's right now.



Cake for breakfast?

Miss Marion L. Mellinger of Havertown, Pennsylvania, wins a $10 award this month for her suggestion on how to get students to eat more nourishing breakfasts. Here's what she did.

She first conducted a Breakfast Poll to find out exactly what students were eating for breakfast—if anything. She discovered that pie, éclairs, sandwiches, even *cake* made up some of the breakfast menus.

The next step was a dramatic presentation of the breakfast problem to the entire school during a weekly assembly. The Drama Club, in cooperation with the school nurse, created and presented a skit entitled: "Breakfast With the Joneses."

At the close of the play each student received a folder describing the *why* and *what* of a good nourishing breakfast. A later Breakfast Poll showed improved breakfast eating habits.

This just goes to prove that a little imagination can go a long way toward helping your students. Thank you, Marion, for your fine suggestions!

You can win

the price of a new hat, too! Just send your ideas and suggestions (about *anything* of interest to home economists) to me c/o "Let's Talk Shop", Kellogg Company, Battle Creek, Michigan. If your suggestion appears in "Let's Talk Shop" you will receive a $10 award. I'm looking forward to hearing from you!

Kay Kellogg

Here's our beautiful new Home Service department laundry

with expanded facilities for serving you . . .

Here, in our greatly enlarged new quarters we have ample space to work with our three laundry starches:

1. Argo Gloss, still the largest selling starch in America.
2. Linit, the modern starch famous for its penetrating action and fine quality finish. Also available in liquid form.
3. Niagara, instant starch, a modern, pre-cooked starch that works perfectly in cold water.

Here, with two banks of new automatic and conventional washers, electric and gas dryers and electric ironer, we are fully equipped to test and answer your questions on laundry starches. We are also able to do a thorough job of preparing consumer information on the finishing phase of home laundering . . . the type of material that should be most useful to you.

Have you seen our brand new Teen-Age Starching Folder?

Jane Ashley, Home Service Dept. J-3
Corn Products Refining Company
17 Battery Place, New York 4, N. Y.

Please send me free _____ copies of "Timely Starching Tips for Teen-Agers" for distribution to my students and/or club members.

Name_____
(Please Print)

Title_____

School or Organization_____

Street_____

City_____ Zone_____ State_____

This cookie project is fun to do...and timely, too!

CRISCO'S EASTER COOKIE BASKET

These delicious "bunny" and "Easter egg" cookies capture the festive spirit of the season . . . are perfect fare for Easter time entertaining. And they offer a wonderful opportunity for teaching imaginative serving. Best of all, students will find them easy to make with the Crisco recipe at right—delightfully good-tasting too. For cookies made with snowy-pure, all-vegetable Crisco come out light, rich and so tender they melt in your mouth!

EASTER COOKIES (Makes about 2½ doz. bunnies or 4 doz. eggs)

All Measurements Level:

1¾ cups sifted enriched flour
¼ teaspoon salt
½ teaspoon baking powder
⅔ cup sugar
⅓ cup Crisco
1 egg • 2 teaspoons vanilla

Measure all ingredients into bowl. Mix thoroughly. Shape into ball. Roll out about ⅛" thick. Cut cookies. Place on ungreased cookie sheet. Bake in 400° F. oven 6-8 mins. Cool slightly before removing.

EASTER BUNNIES: Use a "bunny" cookie cutter or trace "bunny" pattern on this recipe.

EASTER EGG: Make a paper pattern by tracing around an egg, or use egg shape at lower left.

EASY FROSTING:

1½ cups sifted confectioners' sugar
1½ tablespoons hot water
3 tablespoons Crisco
1½ teaspoons vanilla
⅛ teaspoon salt
assorted food coloring
½ square chocolate, melted

Mix sugar and water. Blend in Crisco, vanilla and salt. Divide up icing into tea cups and tint desired colors. Decorate cooled cookies as shown with icing or chocolate, using toothpicks and small knives or pastry tube.

TO HELP YOU PLAN A MARCH PASTRY PROJECT

Send today for free black and white reprints of this ad—available for distribution to students. Write Crisco, Home Economics Dept., Box 296E-8, Cincinnati 1, Ohio, specifying quantity.

2 out of 3 bake and fry with **Crisco**
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Notice of change in address should be received six weeks before the date of issue on which the change is to take effect. Both the *old address* and the *new address* should be given.

How important is a package?

by Betty Crocker
of General Mills

To appreciate the importance of a package, watch the shoppers in a supermarket. How often have you seen a customer pick up a package, study it, perhaps compare it with another, then decide to buy. That is typical behavior.

A consumer research study shows that 48%* of all supermarket purchases are made on impulse—without any previous plan. It also shows that 70.8%* of all supermarket purchases are store decisions—actual buying decisions made right in the store.

At General Mills we believe modern packaging plays a very important part in "impulse" buying. Our pie and cake mix packages, like our ads, feature a four-color picture with strong appetite appeal. In addition, our "family" of packages is identified also by a symbol that means quality to millions of American women. That symbol is a bright red spoon with our Betty Crocker signature in white.

Most people don't realize how much research goes into the "Easy Directions" on the box. Actually, these directions are tried out first in consumer tests, checked by Experimental Food experts, rewritten if necessary, and finally approved by our Research, Advertising, and Home Service Departments. That such research is very valuable was proved in a recent comparison test on pie crust mix in sticks. Betty Crocker directions were rated "very easy" by 99% of women interviewed.

Another service beyond "Easy Directions" are the extra helps on the package. Our cake mix packages, for example, carry "Quick 'n Easy Ways to Serve" the basic cake, icing directions, and other helpful information.

Although a package must attract the customer, and influence her to buy, it must also please the grocer and manufacturer of the product. The

*E. I. Dupont de Nemours & Co.

grocer requires a box that is "shelf-stable"—will not fall over, nor take up too much space.

The manufacturer wants a box that can be filled easily by machine—at the rate of 60 mix packages per minute. And all three, customer, grocer, and manufacturer want to be sure the contents retain their original goodness and freshness.

The "pull-tab" tear strip, *a unique device for opening packages easily and neatly, was designed originally for Answer Cake. It is now used on many other General Mills products.*

These important problems are met at General Mills by our Packaging Research Department with the help of our suppliers.

Each product has its own packaging problems. Our cake mixes require an air-tight package that will not allow gases to pass in or out—which could affect the stability of the flour, keeping quality of baking powder, and enzyme activity of flour. Our cake mixes, therefore, are packaged in clay-coated newsboard lined with special laminated glassine paper that is glued to the outer box. The liner is highly plasticized, is odorless, moisture-proof, and greaseproof.

Betty Crocker Pie Crust Mix, with its very high ratio of shortening, presents a difficult packaging problem. Without proper protection the shortening could seep and ruin the appearance of the package as well as damage the sticks of dough. Our homogenized pie crust mix, therefore, is wrapped in greaseproof vegetable parchment which is stronger than glassine paper, even when wet. The vegetable parchment also makes it possible to wrap by machine which is an important advantage. For further protection, the parchment-wrapped pie sticks are sealed into a polyethylene bag before they are placed in package.

Several packaging problems had to be solved before our new Answer Cake could be introduced. As you know, the Answer Cake package contains three units; one pouch each of cake mix and cake frosting, also an aluminum foil baking pan. The small 7 oz. mix pouch required extra protection from moisture—and both cake mix and frosting pouches needed protection from each other!

After much research the difficulty was overcome by using a pouch stock laminated to foil with a one millimeter covering of polyethylene. Another problem—the foil baking pan could be damaged by careless opening of the outer package. To overcome this danger, a pull tab tear strip was developed which opens the box neatly and safely. The pull tab proved so successful for Answer Cake that it is now used on many other General Mills packages.

Our packages with the bright red spoon must pass several *physical* tests before they reach your supermarket. One machine, the Paint Shaker, discovers the time it takes for fat and flour to form a solid lump at 80° F. Another machine tests the durability and breaking point of the package.

In one of many tests *at General Mills laboratories, our packages get the equivalent of a 24-hour boxcar ride over a desert at 135°.*

Still another machine, consisting of a shaking mechanism inside a cabinet heated to 135° F. gives our packages the equivalent of a 24-hour boxcar ride over a desert!

Severe as these tests may seem, we at General Mills feel they are more than worthwhile. Because we know that when customers reach for the package with the bright red spoon, they have confidence in the quality of our product.

This is another article in a series prepared to give teachers more worthwhile information on our products and services.

General Mills, Minneapolis

Tide Washday Notes #5

Dacron* shirts wash clean

...safely...and easily in modern automatics
with a normal-sudsing detergent

*Du Pont trade-mark

HAVE YOU GIVEN THIS INTERESTING DEMONSTRATION?

1. Wash white Dacron or Dacron-cotton shirts with white articles only. Pre-treat soiled areas (on collar and cuffs) by wetting, sprinkling on Tide and rubbing between hands. Or brush with a soft brush.

2. Dissolve Tide in lukewarm (100-110°F) water. Use regular washing cycle of automatic washer. Reduce final spin to 1-2 minutes or eliminate completely to minimize wrinkling.

3. Hang shirt dripping wet from plastic or other non-staining hanger. Shape collar and cuffs while shirt is still wet. Drip dry. Or dry in automatic dryer following manufacturer's instructions for low-temperature setting.

How to tell the right amount of detergent needed in your automatic

Your automatic cannot do a really efficient job —get clothes really clean without the right amount of detergent.

There's one sure way to tell if you've used the right amount—and that's the suds level in your machine. A good active suds level tells at a glance if there's enough detergent in the wash water, just as the gas gauge tells if there's enough gas to keep a car running.

You have an active suds level when the suds cover the water and move actively with the motion of the machine. When the suds are so thick that they don't move at all, you've been using too much detergent. And when the suds don't cover the surface of the water, you've not used enough detergent for best possible washing results.

In all top-loading automatics, using Tide's suds as a guide, you will find that no sudsless product will wash Dacron shirts (either singly or with a suitable load) cleaner, more easily or more safely than Tide.

Tide is recommended by the makers of 25 automatic washers. And in order that their machines give the best results possible from the start, the following leading manufacturers of top-loading automatics put a free box of Tide in every new washer.

ABC-O-MATIC	BARTON	FIRESTONE	MARQUETTE	SPEED QUEEN
AMBASSADOR	BLACKSTONE	GENERAL ELECTRIC	MAYTAG	WHIRLPOOL
AMC	CORONADO	HOTPOINT	NORGE	WIZARD
APEX	EASY	KELVINATOR	ONE MINUTE	ZENITH
		KENMORE		

This is the fifth of a series of Washday Notes from Tide, America's favorite for automatic washers. Clip this page for reference. For reprints, write Tide, Procter & Gamble, Dept. E., Box 296, Cincinnati 1, Ohio.

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Serve as an ARMY DIETITIAN

As an Army Dietitian, your career will be more complete from every angle.

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U. S. ARMY
Medical Specialist Corps

E56-2

The Surgeon General, United States Army
Washington 25, D. C.
Attn: Personnel Division

Please send me further information on my opportunities as an Army Dietitian.

My present status is (check one)

STUDENT:
——High School
——College
——Dietitian

GRADUATE:
——College
——Dietitian

OTHER:

Name_____

Address_____

City_____ State_____

These Figures Tell the Story

NUTRIENTS and CALORIES	N.R.C. ALLOWANCES* Physically Active Male	CEREAL SERVING CONTRIBUTION**	PER CENT OF DAILY ALLOWANCES
PROTEIN	65 Gm.	7.85 Gm.	12
CALCIUM	0.8 Gm.	0.17 Gm.	21
IRON	12 mg.	1.44 mg.	12
PHOSPHORUS	1.2 Gm.	0.215 Gm.	18
VITAMIN A	5000 I.U.	187.5 I.U.	4
THIAMINE	1.6 mg.	0.16 mg.	10
RIBOFLAVIN	1.6 mg.	0.24 mg.	15
NIACIN	16 mg.	1.4 mg.	9
CALORIES	3200	208	6.5

OF THE NUTRIENT CONTRIBUTION OF THE CEREAL AND MILK SERVING . . .

As the table above vividly shows, the nutrient contribution of the cereal and milk serving** is unusually generous, not only as to the number of nutrients, but also as to the amount of each nutrient supplied. In the case of most nutrients, 10 per cent or more of the National Research Council's Recommended Daily Dietary Allowances for a physically active male is supplied by this serving. Any food which contributes 10 per cent of the daily requirement of a given nutrient in each 200 calories of that food, is considered a good source of that nutrient. A glance at the chart above shows that the cereal and milk serving comes close to making this ideal contribution. Of added nutritional significance is its generous contribution of B complex vitamins and iron and the high calcium content.

Early in April each year the American Dairy Association and the Cereal Institute and its members join together for the Spring Cereal and Milk Festival to promote this economical and convenient food team with the slogan—"You Never Outgrow Your Need for Cereal and Milk." Breakfast cereals are an important carrier of milk in the diet and account for about 15 per cent of fluid milk consumption. More milk is eaten with cereals than with any other single food.

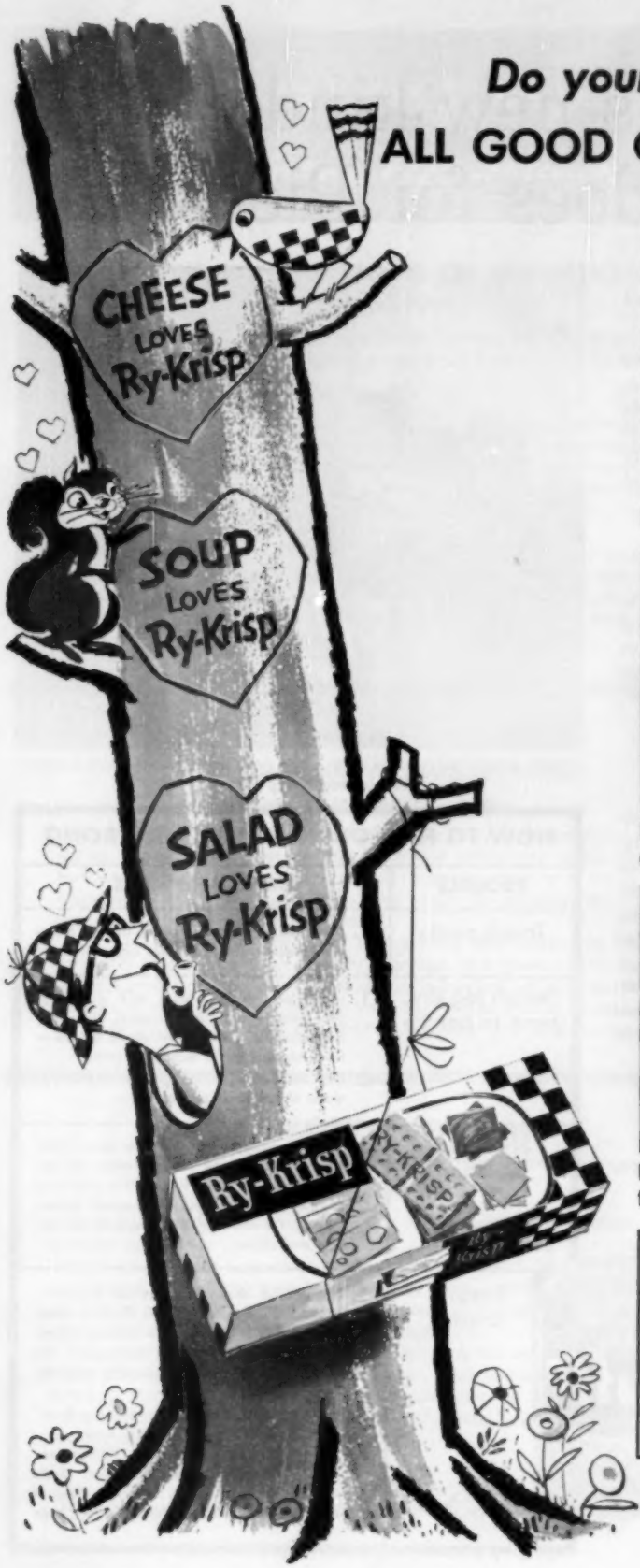
*National Research Council's Recommended Daily Dietary Allowances—Revised 1953.

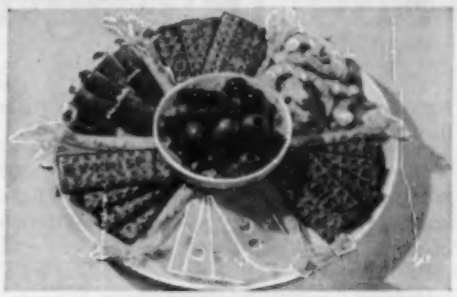
**1 oz. of breakfast cereal (whole grain, enriched or restored), 4 oz. whole milk, 1 teaspoonful of sugar. Based on composite average of breakfast cereals on dry weight basis.

CEREAL INSTITUTE, Inc., 135 South La Salle Street, Chicago 3, Illinois
A research and educational endeavor devoted to the betterment of national nutrition

Do your students know...

ALL GOOD COOKS LOVE Ry-Krisp





Ry-Krisp makes cheesin' more pleasin'. Everyone loves the way Ry-Krisp brings out the flavor.

Ry-Krisp and soup are snazzy together. The crisp rye taste admirably abets any soup.

Ry-Krisp is simply swell with salads. It's the perfect partner for fruit or greenery.

FREE TEACHING AIDS

Send for your Home Economist's Kit containing samples of useful teaching aids. These materials are all available in quantity upon request.

Write for Kit No. C4570

RALSTON PURINA CO., NUTRITION SERVICE
6 H-F CHECKERBOARD SQUARE, ST. LOUIS 2, MO.

PRODUCT NEWS ABOUT FLUFFO

What this new kind of shortening does for Piecrust

Q. How do the distinctive ingredients in Fluffo affect its performance in pastry making?

A. The golden yellow color derived from carotene means that pastry is golden even before it is baked, browns beautifully. The presence in the formula of meat fats processed in an exclusive way makes for excellence in pastry texture. Fluffo's soft fluffy texture and greater plasticity make it easier to handle.

Q. Does Fluffo call for special piecrust recipes?

A. No, you can use it in all your regular recipes without changing a single measurement. For a good short dough that is still easy for the beginner to handle, a proportion of ⅓ cup Fluffo to each cup of flour is recommended, with ½ teaspoon salt and 2 tablespoons water.

Q. How does Fluffo help me teach?

A. Home economists tell us they find the color a definite visual aid in teaching, particularly for pastry. The contrast in color makes it easy to see how flour and Fluffo are blending. Particle size is clearly defined. The character of the dough makes rolling and shaping unusually simple, even in unskilled hands.
Recipes are tested, of course! However, since beginners often fail to follow recipes accurately, you may want to teach the causes of piecrust failure (see chart at right).

Q. Are other teaching aids available?

A. Yes, INDEED! Simply fill out and mail the coupon, right below:

Flaky, tender piecrust is easy, even for the beginner, with Fluffo's better shortening formula.

HOW TO FIND OUT WHAT WENT WRONG

TROUBLE	CAUSE AND CURE
Tough pastry	1. Means not enough shortening. Use full measured amount, ½ cup to each cup of flour.
Dough too dry, hard to handle	1. Incomplete mixing. Don't add water till your mixture looks like cornmeal. Stir water in thoroughly. Don't be afraid to handle — final mixing may be done with hands. 2. Not enough liquid. Use exact amount of water called for in recipe.
Shrinking, buckling	1. Pastry stretched when rolled, or when fitted into pan. Use large enough recipe for pan size, ease dough into place without stretching. 2. Unfilled shell not pricked enough before baking. Be sure to prick generously on bottom and sides.
Soggy crust	1. Not enough shortening. Use full amount — at least ½ cup to 1 cup flour. Properly shortened dough is less likely to soak up filling. 2. Failure to make sufficient steam-vents. Cut small holes in top crust especially near the center. 3. Crust too thick, not uniform. Roll evenly ⅛" thick for both top and bottom crusts. 4. Filling too thin — cook cream fillings completely before adding fruit juice. Drain canned fruit thoroughly. Use more flour or cornstarch to thicken if filling is very juicy.

The Procter & Gamble Company
Box 687, Cincinnati 1, Ohio

Please send me without charge the following:

—copies of Illustrated Basic Pastry Lesson Poster (Limit: 2 per request)
—copies of "'What's Newest' in Baking and Frying," 20-page recipe booklet
☐ 3 lb. demonstration sample of Fluffo

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School.....
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City.....Zone.....State.....

3 New Books for Teachers, Students, and Homemakers —from Macmillan

ROSE'S FOUNDATIONS OF NUTRITION, 5th Edition

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READY SPRING 1956

Practical applications for student, homemaker, and professional worker. This new edition features an appreciation of nutrition problems in countries throughout the world . . . the role of nutrition in public health . . . the importance of research in the advancement of the science of nutrition . . . the desirability of applying this knowledge for the maintenance of the student's own health . . . the latest findings plus significant interpretation.

About the fourth edition: ". . .The book is one of the best of its type for teaching the fundamentals of foods and nutrition. Written in a straightforward, easily read style and well illustrated with impressionable photographs, it serves as a fine textbook in basic nutrition and reference source for food values." —from the Journal of the American Medical Association

MEAL MANAGEMENT

by FAYE KINDER, *Michigan State University*

1956 400 PAGES $5.50

Challenges the student and future homemaker to use intelligence and creative ability in making mealtime an experience that strengthens family ties. Tells how to "manage" the food dollar . . . prepare, plan and serve meals ("company" meals, children's meals, and meals for reducing diets) . . . write menus . . . carve meat and poultry, etc.

"The book fulfills its title, *Meal Management.* The author has been very successful in planning meals that are nutritious and pleasant. The discussion of management of time, money, and energy is detailed, yet sensible. The illustrations, so important in our modern textbooks, should give the reader pleasure, and a desire to follow their example."—a professor who read the manuscript

A TAILORING MANUAL

by GERTRUDE STRICKLAND, *Oregon State College*

READY SPRING 1956

Published privately in 1944, it did not receive commercial promotion but attained nationwide circulation. Teachers will welcome this textbook . . . rewritten according to suggestions of those who have used the book, including new illustrations and new material on tailoring slacks, making a dress form, and making the preliminary muslin garment . . . *plus* pertinent information on equipment and tools . . . shrinking . . . pattern alteration, etc.

"The manuscript has some very good technical directions not found in other books. Directions are clear in themselves and . . . are sufficiently and well illustrated . . . Strickland's work presents more fine points to help beginners and home tailors . . .The beauty of her book is its simplicity."—a professor who read the manuscript

The Macmillan Company

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—*Journal of Home Economics*

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1952 408 pages $5.00

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Washington News

Meeting of Executive Committee

The executive committee of the American Home Economics Association met at AHEA headquarters in Washington January 20, 21, and 22, 1956, for its regular midyear meeting. High lights of the agenda included review of plans for the 1956 annual meeting, discussion of meeting places for the Association in 1958 and 1960, and plans for the International Congress of Home Economics.

• **International Congress in 1958.** The Ninth International Congress of Home Economics is to be held in the United States in the summer of 1958 with the AHEA and the Canadian Home Economics Association as sponsors.

The AHEA executive committee voted on themes suggested by the countries represented on the Permanent Council of the Federation and suggested two possible dates for the Congress—one in July and one in August 1958. The AHEA meeting will be held June 24 to 27 and the Canadian HEA meeting is scheduled for July 1 to 3, 1958.

The executive committee authorized the president to appoint an organizing and planning committee for the Congress and authorized the executive secretary to proceed with plans for arrangements for the Congress. A location in the East seems most feasible since many of the delegates from abroad will be coming from European countries and many will probably wish to attend the AHEA or the Canadian Association meeting as well as the International Congress. The Congresses usually plan for an attendance of about 1,000 persons.

• **International Federation of Home Economics.** The executive committee of the IFHE, at its meeting in September 1955, established a country-by-country quota for financial support of the Federation in an effort to achieve a working budget for the Federation which, until a year or two ago, was largely supported by the Canton of Fribourg in Switzerland. The headquarters of the Federation is now in Paris, and the Swiss support has been discontinued. The fees established for countries in the Federation are based on the amounts the countries pay toward support of some of the United Nations agencies. The collective members within a country are responsible for collecting the fee. For the United States this responsibility falls on the American Home Economics Association. The fee for the United States is 600,000 French francs ($1,725).

The executive committee of the AHEA voted to pay the current fee of 600,000 French francs to cover collective memberships for the AHEA and for all of the state home economics associations that wish to become collective members of the Federation.

• **AHEA Annual Meetings.** The executive committee voted to hold the 1958 annual meeting in the East instead of in the West, where it would normally be held under the present plan of rotation of regions for the meeting. Because the International Congress will be meeting in the eastern United States in 1958, it seemed more logical to hold the AHEA meeting in the same area that year. Locations and dates of future meetings, therefore, are:

Washington, D. C.—June 26 to 29, 1956
St. Louis, Missouri—June 25 to 28, 1957
East—June 24 to 27, 1958
Milwaukee—June 23 to 26, 1959
West—location and dates tentative, 1960

• **United Nations Cookbook.** At the invitation of the U. S. Committee for the United Nations the AHEA will co-operate in preparation of a revised and enlarged edition of *The World's Favorite Recipes.* The U. S. Committee for the U.N. expects to be able to offer the new book in quantity and at a discount to groups for resale as a money-making project. Harper & Brothers, publishers of the book, expect to have the new edition off the press in September.

• **A Look Ahead.** With the 50th anniversary of the AHEA coming within a few years, it seemed appropriate to the executive committee to make plans for some evaluation of the past and a look ahead into the future. Miss Dennis and the executive committee will name a group of members to begin this assignment.

AMERICAN HOME ECONOMICS ASSOCIATION
Forty-seventh Annual Meeting, Washington, D.C., June 26 to 29, 1956
Headquarters: National Guard Armory

VOLUME 48, NUMBER 3, MARCH 1956 JOURNAL OF Home Economics

This study demonstrates that much can be done to improve living comfort in hot valley areas where families of moderate or low incomes are building thousands of small houses annually. Careful planning of the surrounding outdoor areas, utilizing the plant materials native to the region, is one means of increasing indoor thermal comfort; another is proper choice of window coverings based upon their ability to insulate or reflect heat.

Environmental Influence on Orientation and House Design to Improve Living Comfort[1]

G. J. Everson, L. W. Neubauer, and R. B. Deering

I. Description of the Mobile Housing Unit and Methodology

The rapid increase in population country-wide, plus a 17.3 per cent gain in population for California during 1950-54 as compared with the national increase of 6.3 per cent, has centered attention on the future housing needs of the state and especially on improving living comfort in hot regions (*1*).

In the vicinity of Davis in Yolo County and in several neighboring counties, the average daily maximum temperature in July and August is between 95° and 96°F, temperatures over 90° occurring on 23 days of each month, with readings over 100°F reached on 9 days in July and on 7 days in August.[2] Long-time weather data are shown in chart 1.

Effective cooling usually results at night, however, the average minimum being 54°F for July and August. Each month included about 23 nights in the mid-fifties, with minimum temperatures falling below 60° on 27 nights in July and on 28 nights in August.

This wide fluctuation permits good cooling inside houses at night, but the long hot day causes heat distress in small light houses, and many procedures have been used in an attempt to achieve comfort.

The authors are all members of the faculty at the University of California at Davis. Dr. Everson is professor and chairman of the department of home economics, Dr. Neubauer is an associate professor of agricultural engineering, and Dr. Deering is an assistant professor and chairman of the department of landscape management.

Perhaps it should be emphasized that the American Society of Heating and Ventilating Engineers points out in its *Guide* (*2*) that the temperature zone found most comfortable for people at rest in summer ranges from 71°F at 100 per cent relative

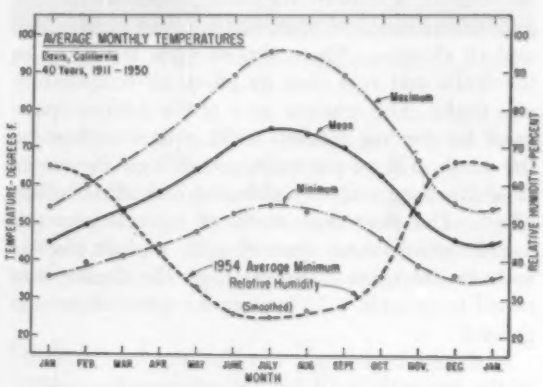


CHART 1. TEMPERATURE AND RELATIVE HUMIDITY DATA FOR DAVIS, CALIFORNIA

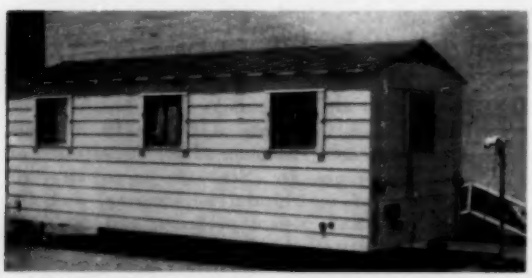
[1] Western Regional Housing Project W-8.

[2] Data obtained from the department of agricultural engineering, University of California at Davis.

humidity to 82°F at 10 per cent relative humidity. According to the *Guide*, these conditions are usually exceeded in this region during the full summer period.

It was, therefore, considered important to further explore means of improving living comfort in hot regions and to make this information available to home owners, architects, and builders. Studies dealing with problems of orientation, house design, and the use of plant materials and home furnishings were initiated to determine how each might assist in making homes more comfortable.

Certain phases of the anticipated study, especially those dealing with the use of plant materials and orientation, could be explored to good advantage through the use of a mobile housing unit. Therefore, a light structure, a cottage-type house trailer 20- x 8- x 7-feet, was purchased and equipped for temperature studies. See photograph 1.



Photograph 1. The experimental housing unit

Structure and Materials of the Unit

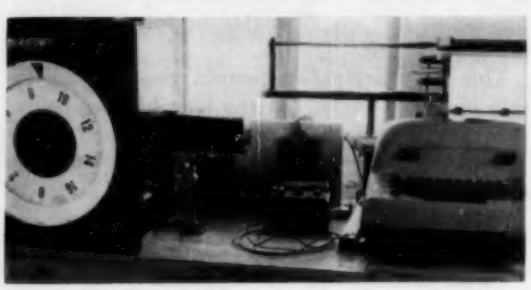
The trailer was believed to resemble a typical low-cost frame house. Difference from other types of housing will be brought out. The construction included 2- x 3-inch studs and clapboard siding, painted white. The roof was covered with green asphalt shingles. There was so little insulation in the walls and roof that its effect on temperature was slight. The window area of the interior space used for testing totaled 1,152 square inches on the south, 576 on the west, and 899 on the north. Roof overhang was negligible and had little shading effect. The floor was made of ½-inch plywood boards which were covered with asphalt tile ⅛-inch in thickness. The floor of the trailer was raised to provide a 13-inch crawl space above the ground.

It should be brought out that the heat capacity of the currently used light structure differs widely from heavy buildings made of concrete or stone. Another important difference is also due to the crawl space in the case of the trailer. The ground is a large thermal reservoir which has a marked bearing on room temperature. Heavy buildings take considerably longer to warm up and, similarly, cool off more slowly. The greater the cubic volume of the house, the less rapid is the room temperature change. Furnishings, amounting to approximately 5,000 pounds in the average home, also add to the heat capacity. In the current studies the trailer test room included some minor shelving, a sink, and a stove. Except for these items, the room was cleared of customary furnishings. Therefore, it was to be expected that the trailer would respond relatively rapidly to changes in environmental temperature.

Since there are many one-story houses without basements and with only moderately good construction in this section of the country, the data obtained through the use of the described house-trailer were considered to be of value in helping determine the most effective and economical procedures for improving living comfort during the hot summer months. Since this type of building presents the most frequent and severe heat problems, the experimental unit appeared to be a suitable structure for the project.

Instrumentation

The principal installation for obtaining temperatures consisted of 16 thermocouples made of iron and constantan wire located in the surfaces of the walls, floor, roof, and ceiling, as well as in the air space, indoor and out. Temperatures were read automatically every 30 minutes, day and night, by a commercial Brown potentiometer or millivoltmeter, a balancing motor, and a decade switch which activated an electric IBM typewriter, recording the 16 temperatures at regular intervals. The general appearance of the equipment is given in photograph 2. This equipment was located in a small room at one end of the trailer which was



Photograph 2. Temperature recording instruments

separated from the main test room at the opposite end of the structure by a double curtain wall and entryway.

A microweather station, recording dry and wet bulb temperatures and wind velocity and direction, was located in close proximity to the trailer. In addition to these data, considerable information regarding weather-type classification was available through H. B. Schultz of the agricultural engineering department.

As each variable was introduced to measure its effect upon room air temperature, weather data were collected over several days' time. Comparisons made from these studies have in each case included comparing days of similar maximum dry bulb temperature and of like weather type.

Summary

Details have been given of the materials and construction of a house-trailer which was selected as a mobile housing unit to explore the importance of orientation, house design, and the use of plant materials and home furnishings on living comfort in hot climates.

II. Preliminary Studies of the Value of Plant Materials in Regulating Room Air Temperature

Publications in 1953 by Deering and Brooks (*3*) and Deering (*4*) have pointed out the potential value of plant materials in improving living comfort in hot climates. Considerably more information is desired on this subject to assist homeowners in the selection of plant materials which will create a desired influence on house temperature and because it would be advantageous to know more about the relationships of many plant materials to surrounding air temperatures from the standpoint of avoidance of frost or improving harvesting dates.

The availability of a mobile housing unit equipped with thermocouples and weather recording instruments, as described in part I, made it possible to initiate a series of studies to determine to what extent various plant materials might influence room air temperature.

Procedure

The mobile housing unit was located at three positions where shade conditions differed greatly. At each site the trailer was located with its long axis running east and west. Half-hour readings of wet and dry bulb temperatures were obtained and recordings of temperatures made from thermocouples located at the following points: on the roof, ceiling, floor inside and out, room temperature east wall outside, south wall inside and out, west wall inside and out, and the north side inside and out.

Site A was an open field which had recently been disked. The bare dry ground area was devoid of all vegetation and shade. This area was chosen as a control site. It is typical of many situations with which homeowners are faced.

Site B was east of and adjacent to a large grove of eucalyptus trees which provided afternoon shade. See photograph 3. A good cover of turf was present on all sides.

Photograph 3. Trailer located adjacent to a large grove of eucalyptus trees

Site C was a location beneath a group of large fig trees where the foliage completely covered the trailer with the exception of the north side. In this position no direct sunlight struck any part of the structure. A good turf was located adjacent to the north. Temperature data were collected for several days at each site.

Findings

Upon comparable weather-type days when the maximum dry bulb temperatures varied between 85° and 87°F at approximately 4 p.m. (Pacific

Daylight Time) the various sites were found to bring about a marked difference in the room temperature of the trailer.[3] These data are given in charts 2 and 3.

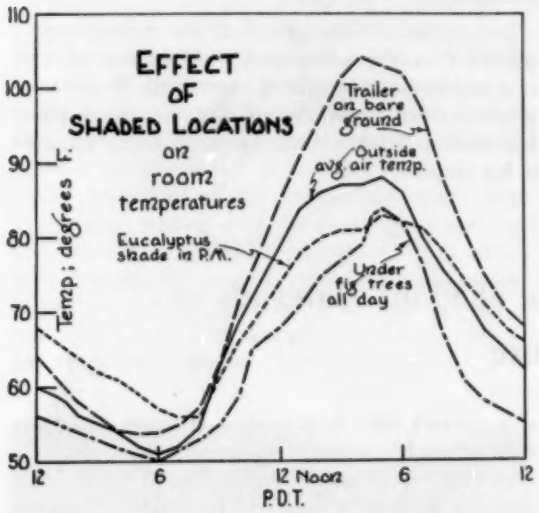


CHART 2. EFFECT OF SHADED LOCATIONS ON ROOM TEMPERATURE OF THE TRAILER

In the case of site A, there was a rapid accumulation of heat resulting in a maximum room temperature of 104°. Roof temperatures reached 152°. Room temperature in this location exceeded a comfortable 75° for 11.5 hours of the day.

For site C, which was in the shelter of the heavy fig tree foliage, the room temperature never exceeded 83°. At this location the room air remained above 75° only five hours of the day. Throughout the majority of the time, room temperature was too cool for comfort. This site had the disadvantage of providing poor natural light due to the dense foliage.

The most ideal site (B) was found when the trailer was located on the east side of the eucalyptus grove where the tall trees shaded the roof of the trailer by approximately 12 noon (PDT). This location proved desirable from several standpoints. It provided morning sun which caused a prompt rise in room temperature to a comfortable zone. This was not accomplished to the same extent in site C. However, the shading of the roof by approximately noon avoided the extreme rise in room temperature observed at site A. As the sun lowered, there was a slow return of room temperature to 75° and below. In addition to maintaining a comfortable temperature over a longer portion of the day than had been achieved for sites A or C, site B permitted good natural light.

Chart 3 gives detailed information regarding roof and room temperatures of the trailer when it was located in site B. The chart illustrates the rapid rise in roof temperature produced by the morning sun, with accompanying increase in room temperature. Then, as the shade began to cover the roof, a 36° drop in roof temperature occurred in one hour's time after arrival of the shadow. The interior heating continued to rise, but within two hours the room temperature began to level off and finally to lower.

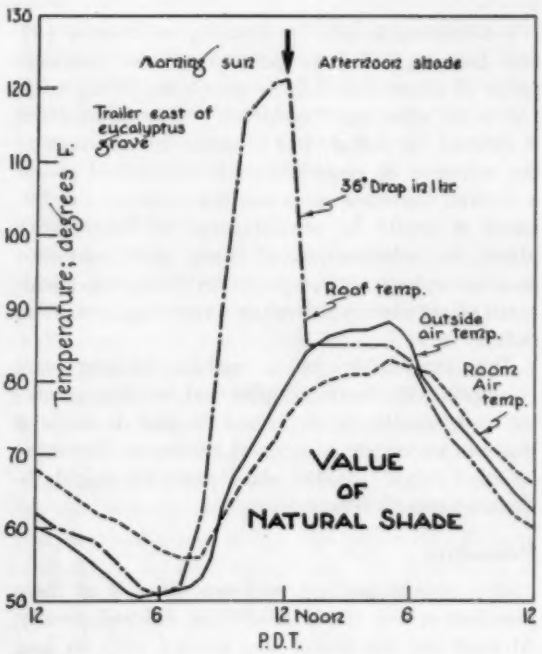


CHART 3. EFFECT OF AFTERNOON SHADING OF THE ROOF OF THE TRAILER ON INTERNAL ROOM TEMPERATURE

Summary

Three sites differing greatly in the amount of shade they provided have been tested to determine to what extent plant materials might influence room temperature of an experimental housing unit. The data illustrate the great importance of shade trees in improving living comfort in hot climates.

[3] The authors are indebted to H. B. Schultz of the agricultural engineering department for information on weather-type. Since the summer of 1954 was unusually cool, maximum temperatures were considerably below those of normal years during this portion of the work.

III. Effect of Certain Home Furnishings on Room Temperature

The choice of window and floor coverings is extremely important to the majority of homemakers in order to achieve interesting color and texture effects in furnishing the home. In the West, especially with the increased use of glass in houses, such purchases are of considerable economic importance to the consumer. Several types of information are desired by the prospective buyer of such materials: the serviceability of the fabric, its ability to resist sun fading, and its value in influencing comfort of the home through its properties of insulating against and of reflecting heat. In very few cases is such information available to the interested buyer.

To obtain data on the relative importance of window and floor coverings in regulating room temperature, a series of experiments was conducted to determine the influence of several selections upon room air temperature of the experimental housing unit described in part I. The interior space used in testing air temperature was the larger of the rooms, with a window area of 1,152 square inches on the south, 576 on the west, and 899 on the north, as previously described. Though each of the rooms had an outside entrance, the smaller of the rooms was used as the only entrance to the unit when tests were being conducted. Thermocouples placed at several positions on and in the trailer were connected with automatic recording instruments which were housed in this section of the unit.

Description of Materials Tested

The floor of the trailer was made of ½-inch plywood boards which were covered with asphalt tile ⅛-inch thick. The influence of a wool carpet was tested when the trailer was located in a courtyard providing no protection from the sun. This carpet combination was:

An all-hair pad approximately ⅓-inch in depth was laid wall to wall. This was covered with an all-wool carpet consisting of loose loops approximately ½-inch in depth.

Five widely used window covering materials were tested when the housing unit was located in an open field which provided no protection from the summer sun. Window covering choices were as follows:

1. A Venetian blind of horizontal metal slats two inches in width which was sprayed with ivory-colored paint of semi-high gloss. Installations were made so that the blinds fitted snugly to the inside of the glass. All tests were carried out when the blinds were completely closed, excluding all light through the window area.
2. A Venetian blind made of horizontal ivory-colored two-inch plastic slats. Installations were similar to those described for the metal Venetian blinds. This selection permitted some light to enter the room even though the blinds were completely closed. Window coverings of this type are frequently used in rooms in which privacy is desired but some natural light is advantageous—such as in offices where the windows may be partially at subground level.
3. A walnut-colored, fiber shade made of ¼-inch horizontal fiber slats stitched at 1½-inch intervals with cotton thread of the same color. This blind is sold in many shops as a decorative covering which offers some protection against sun.
4. A canvas awning installed in the customary manner on the exterior of the window. The lower edge of the awning extended approximately 14 inches from the window, thus preventing the sun from striking the glass at any time. The particular material tested was a wide stripe of rust and cream colors.
5. A decorative aluminum screen installed in a narrow wood frame which held the screen 1½ inches from the glass of the window. The aluminum screen consisted of many tiny aluminum louvers tilted at a slight downward angle. A soft green color was applied to the screen, adding interest to the material and reducing glare.

Temperature Data

Dry bulb temperatures during July when the floor and window covering tests were conducted are given in chart 4. Temperatures at five important positions on and within the trailer are also given for the same days. These values are average figures for three days when the maximum dry bulb temperatures varied from 91° to 92°F and the weather-type was the same.[4] As mentioned earlier, the trailer was located in a courtyard which provided no protection from the sun and no window or floor coverings were in use. Time is given as Pacific Daylight Time.

Typical cool morning and early evening temperatures are illustrated in chart 4 together with the characteristic rapid rise in dry bulb temperature by noon which continued and increased until approximately 4 p.m. Due to the intense heat on the asphalt-shingle roof of the trailer, which was found to reach 164°F at 1 p.m., heat was gained rapidly within the trailer. Ceiling temperatures reached a maximum of 117°F at approximately 3 p.m., while the maximum room temperature occurred slightly later and was 107°F.

[4] See footnote 3.

Findings

Influence of floor covering upon room air temperature. It will be observed from chart 5 that a measurable and adverse effect upon room air temperature was produced by the presence of a wool carpet and a hair pad. They had the effect of insulating the room from the cooler floor. The use of this particular floor covering resulted in a higher maximum room temperature at approximately 4 p.m. than when no rug was used. The presence of the wool carpet showed its effect earlier, and at approximately 2 p.m. the room air temperature exceeded that characteristic of the trailer when no floor covering was used. As the housing unit cooled, the presence of the floor covering created a three to six degree disadvantage, by reducing heat losses through the floor. Since the influence of the floor covering under the described experimental conditions was small, no further attempts were made to test the effect of additional materials commonly used as floor coverings. The studies suggest, however, the minor importance of this type of home furnishing on heat retention or loss.

Value of several window coverings in regulating room air temperature. Results of the influence of several types of window-covering materials on room air temperature are given in charts 6 and 7. The presence of a decorative aluminum screen apparently had no beneficial effect upon room temperature under the conditions of the study. At the time these tests were made, the weather was extremely hot, and dry bulb temperatures reached 96°F. At these times the experimental housing unit accumulated heat rapidly, largely due to the unprotected roof. The data point out the ineffectiveness of window coverings of this type when the window area is relatively small and the building is exposed to direct rays of the sun throughout the day. Because of irregularities in these data, some of the experiments will be repeated.

The installation of Venetian blinds made of either metal or plastic slats, or the use of a fiber shade installed on the inside of the window, had

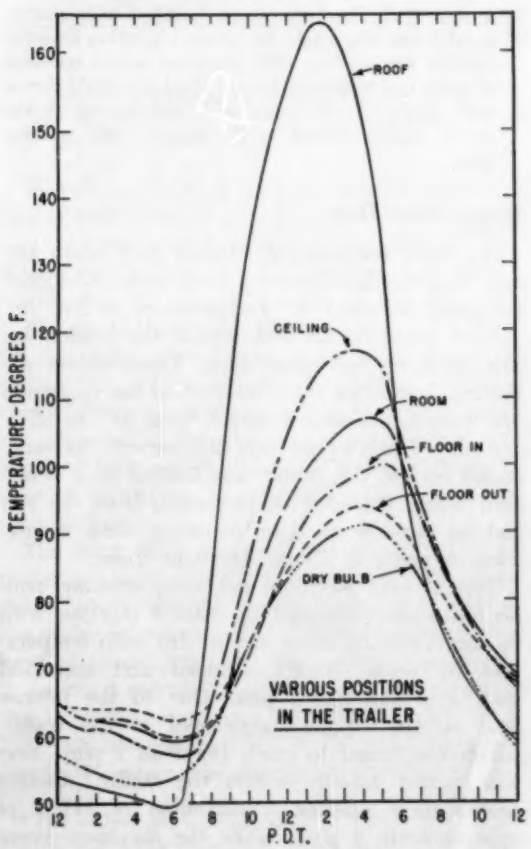


CHART 4. TEMPERATURE AT VARIOUS POSITIONS IN THE TRAILER

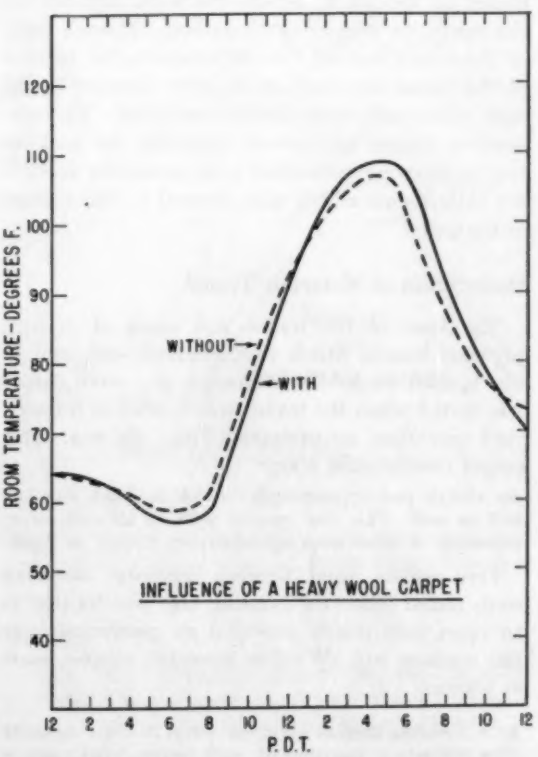


CHART 5. INFLUENCE OF A WOOL CARPET ON ROOM TEMPERATURE

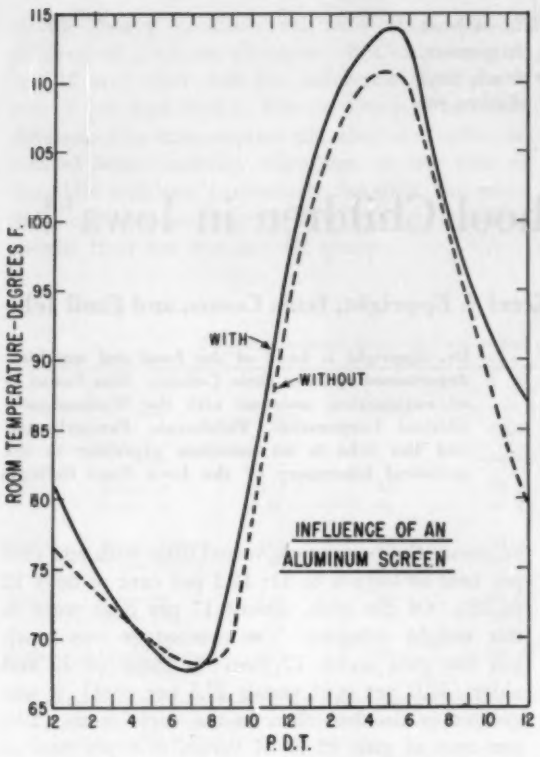


Chart 6. Influence of an Aluminum Screen on Room Temperature

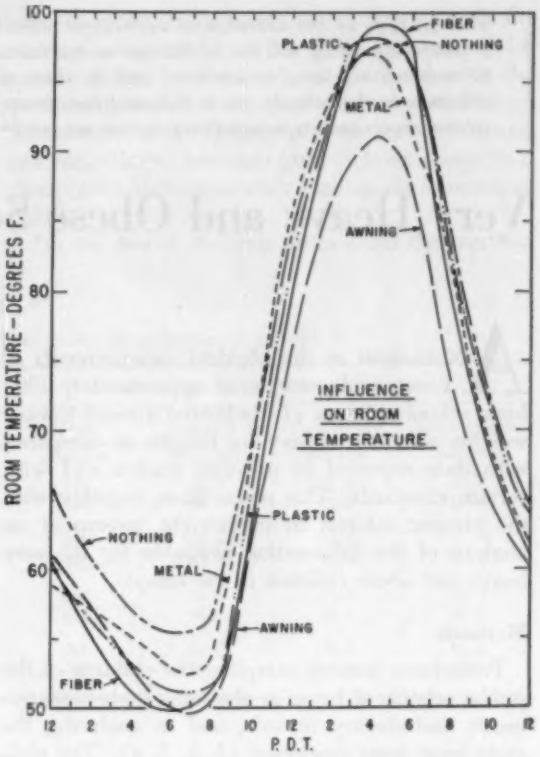


Chart 7. Influence of Several Window Coverings on Room Temperature

little influence upon room air temperature when the trailer was located in an open field where it was exposed to the sun. It will be noted, however, that the use of an awning window covering of the customary type which projects beyond the glass, thus preventing the rays of the sun from striking the pane, improved the room air temperature to a significant extent.

Since the above window materials were tested under conditions where the total window area was small and the housing unit was accumulating heat rapidly, due to its exposure to the sun, additional studies are in progress testing the same materials and others when larger window areas are involved.

The present data are of value in pointing out that the installation of certain types of window covering materials on the inside of the glass has a very minor beneficial effect on room temperature.

Covering the floor with wool carpeting has a small and adverse effect on room air temperature in hot climates.

The installation of certain types of window coverings on the inside of the glass has relatively little value in reducing heat in housing units which provide only small window areas. Improved heat control is possible in such housing, however, by installation of coverings such as awnings on the exterior of the house, thus preventing direct sun rays from striking the glass.

Additional studies are in progress to test window covering in housing units with large areas of glass.

Summary

Preliminary studies testing the influence of floor and window coverings on room air temperature have led to the following conclusions:

References

1. Nine million more Americans—where. *U. S. News & World Report*, Nov. 5, 1954, p. 43.
2. American Society of Heating and Ventilating Engineers. *Heating, Ventilating, Air Conditioning Guide*. Volume 32. ASHVE, 51 Madison Avenue, New York 10, N. Y. (1954).
3. Deering, R. B., and Brooks, F. A. Landscaping for summer shade. *Calif. Agr.* **7**, No. 5 (May 1953), p. 11.
4. Deering, R. B. Planning the garden. *Calif. Agr. Expt. Sta. Exten. Serv. Manual 10* (1953).

This analysis of the nutrition of overweight school children from a state-wide study will be of interest to nutritionists, to parents, to research workers, to teachers, and to those who teach food selection in the schools, for it indicates one group of children for whom improvements in nutrition practices are needed.

Very Heavy and Obese School Children in Iowa[1, 2]

Ercel S. Eppright, Irma Coons, and Emil Jebe

Dr. Eppright is head of the food and nutrition department at Iowa State College. Miss Coons is an engineering assistant with the Westinghouse Electric Corporation, Pittsburgh, Pennsylvania, and Dr. Jebe is an associate professor in the statistical laboratory of the Iowa State College.

An analysis of the physical measurements of a state-wide sample of approximately 1200 Iowa school children (*1*) indicated a trend toward weights somewhat heavy for heights as compared with data reported in previous studies and with certain standards. This observation, together with the current interest in overweight, prompted an analysis of the information available for the very heavy and obese children in the sample.

Methods

Procedures used in sampling the children of the public schools of Iowa, in obtaining body measurements and dietary records, and in analyzing the diets have been described (*1, 2, 3, 4*). The children selected for this study were those in the A_3 or higher channels on the Wetzel Grid and are described on the Grid as being very heavy or stocky and obese (*5*) and will also be referred to in this discussion as overweight. The nutrient consumption, use of food from the different food groups, and distribution of calories among meals and snacks of these overweight children were compared with similar data pertaining to children in the middle physique channel (M) on the Grid. These groups were formed by post-stratification after a single sample had been obtained to give unbiased representation of the respective populations of the strata included in the sample.

Results

Of the boys, almost 11 per cent were very heavy or obese; the percentage varied little with age (9.9 per cent of boys 6 to 11; 12.2 per cent of boys 12 to 18). Of the girls, almost 17 per cent were in this weight category. The percentage was much less for girls under 12 than for those of 12 and older (12.0 per cent versus 22.5 per cent); it was greater in the late than in the early teens (19.0 per cent of girls 12 to 14 versus 27.4 per cent of girls 15 to 18).

The mean body measurements and concentrations of certain blood constituents of the heavy children were compared with those of children of medium physique in the sample. The children of both sexes were divided into two age groups, those below 12 and those 12 and older. In mean body weight, very heavy and obese children exceeded the children of medium physique in corresponding age groups by 8.4 to 14.9 kg (table 1). Differences in mean leg-girth measurements were also marked. In height, chest breadth, and bi-iliac diameter the differences were very small in all the age-sex groups; but the means for the heaviest children were usually larger than were those for the children of medium weight.

The mean concentrations of blood constituents of a subsample of children in each group revealed no striking or consistent differences (table 2). Among the girls aged 12 and older, the serum alkaline phosphatase concentrations of the heavier girls were less than were those of the girls of medium weight (3.21 NPU versus 4.62).

Comparisons were made between nutrient consumption of the heavy children and that of the children of middle physique (table 3). Except for boys below age 12, the calorie value of diets

[1] Contribution No. 19, Subproject 2—The Nutritional Status of School Children: The School Lunch as an Influencing Factor—of the North Central Region Cooperative Project NC-5, Nutritional Status and Dietary Needs of Population Groups, by (a) Human Nutrition Research Branch of the Agricultural Research Service and (b) Iowa Agricultural Experiment Station, Ames, Iowa, as Journal Paper No. 2789, Project 1021 and 113.

[2] Supported in part by a grant and other assistance from General Mills, Inc., as part of its nutrition education program.

of the heavy children was less than that of children of medium physique. But only for girls age 12 and older was the difference significantly less (5 per cent level). For the group as a whole, differences in consumption of other nutrients calculated were variable. However, in the case of the older children, particularly the girls, the mean daily nutrient consumption was less for the overweight than for the middle group.

The significant difference between the calorie intakes of the heavy and medium girls may have resulted from the efforts of the former to reduce their weight. Because of the low intake of nutrients accompanying the calorie reduction, their efforts would appear to be ill-advised. The mean daily intakes of protein and calcium by the 61 heavy girls, aged 12 and older, were 72 grams and 0.9 gram, respectively, as compared with the corresponding intakes of 80 grams protein and 1.0 gram calcium by the medium girls, and with the National Research Council's Recommended Dietary Allowances of 80 grams protein and 1.3 grams calcium. Heavy teen-age girls in Iowa comprise a group with diets apparently inadequate in nutritive value.

Do the heavy children differ from the medium children in their use of foods? The data obtained permitted an exploration of this problem for the week during which the dietary records were made. The distribution of calories among 11 food groups and of calories among meals and snacks was studied for the two weight classes. The principal differences were found among the older boys and girls. As compared with the medium teen-age boys, the

TABLE 1

Physical measurements of Iowa school children of two physique classifications, †*

SEX	AGE	CHANNEL ON GRID	NUMBER	PHYSICAL MEASUREMENTS				
				Weight	Height	Leg girth	Chest breadth	Bi-iliac diameter
	years			*kilograms*	*centimeters*	*centimeters*	*centimeters*	*centimeters*
Boys	Below 12	A_3+	31	38.5	133	30.0	21.9	22.6
	Below 12	M	84	30.1	132	26.7	20.5	21.0
Boys	12 and above	A_3+	34	64.4	159	35.8	24.3	27.8
	12 and above	M	65	52.5	161	32.9	25.2	26.3
Girls	Below 12	A_3+	39	39.0	134	30.0	21.4	22.6
	Below 12	M	60	29.7	132	26.7	19.8	21.0
Girls	12 and above	A_3+	62	62.8	157	35.7	25.6	28.4
	12 and above	M	44	47.9	157	31.6	23.4	25.8

* A_3-A_4 channel and above on Wetzel Grid—overweight
† M channel on the Wetzel Grid—medium

TABLE 2

Blood constituents of Iowa school children of two physique classifications

SEX	AGE	CHANNEL ON GRID	HEMOGLOBIN		SERUM CONCENTRATIONS					
					Ascorbic Acid		Carotenoids		Alkaline Phosphatase	
	years		*grams per 100 milliliters*	*number of children*	*milligrams per 100 milliliters*	*number of children*	*micrograms per 100 milliliters*	*number of children*	*NPU**	*number of children*
Boys	Below 12	A_3+	12.9	30	0.94	21	136	20	5.46	22
	Below 12	M	12.7	83	.80	50	107	47	5.01	51
Boys	12 and above	A_3+	13.7	33	.63	17	98	15	6.11	16
	12 and above	M	13.6	64	.63	36	96	35	5.48	34
Girls	Below 12	A_3+	12.0	36	.82	20	109	21	6.23	20
	Below 12	M	12.4	57	1.04	32	124	32	5.44	33
Girls	12 and above	A_3+	13.0	58	.75	31	95	31	3.21	32
	12 and above	M	12.8	43	.57	21	99	23	4.62	24

* Nitrophenol units

heavy boys had fewer calories from vitamin C-rich foods (−20 per cent), eggs (−18 per cent), milk (−14 per cent), sweet foods (−14 per cent), meat substitute dishes (−13 per cent), and the leafy, green vegetables and yellow vegetables and fruits (−10 per cent); but they had more calories from meats (15 per cent). Heavy teen-age girls obtained fewer calories than did the medium-weight girls from the following: sweet foods (−30 per cent), milk (−18 per cent), meat substitutes (−18 per cent), table fat (−16 per cent), cereals (−12 per cent), and meats (−9 per cent), but more from desserts (+11 per cent), eggs (+14 per cent), and C-rich fruits and vegetables (+19 per cent). breakfast and lunch. Dinners were about the same in calorie value for both groups. The ineffectiveness in reducing body weight by omission of breakfast in an unrestricted diet has been demonstrated by Tuttle *et al.* (*6*).

Possibly the heavy teen-age children were trying to reduce their intake by limiting snacks and by reducing food consumption at breakfast and lunch. Consciousness of their overweight may, of course, have made these children reluctant to report food eaten at these times.

A further study was made of the distribution of the overweight children in three dietary classifications (*7*): Class I, those with diets in which

TABLE 3

Mean daily nutritive value of the diets of overweight and medium children

SEX	AGE	CHANNEL ON GRID	NUMBER	FOOD ENERGY VALUE	PROTEIN	CALCIUM	THIAMINE	RIBOFLAVIN	NIACIN
	years			*calories*	*grams*	*milligrams*	*milligrams*	*milligrams*	*milligrams*
Boys	Below 12	A_3+	30	2417	78	1169	1.18	2.11	12.4
	Below 12	M	83	2347	72	1089	1.11	1.99	12.1
Boys	12 and above	A_3+	32	3047	92	1092	1.46	2.18	16.2
	12 and above	M	62	3157	95	1232	1.49	2.38	16.3
Girls	Below 12	A_3+	40	2082	67	1004	1.08	1.88	10.9
	Below 12	M	58	2176	66	961	1.07	1.78	11.3
Girls	12 and above	A_3+	61	2373	72	903	1.13	1.74	12.8
	12 and above	M	44	2604	80	1031	1.27	1.99	14.0

Again, if the heavy children were making a conscious effort to reduce, their choice of food, for the most part, would seem questionable, particularly as regards the use of milk and of other important food groups. Heavy children, both boys and girls, reported the use of fewer sweet foods (as candy and soft drinks) than did the medium children; but the heavy girls reported the greater use of desserts (as cakes and pies). The medium children of this study are not cited as a standard, but deviations from data for the medium group may reflect adjustments which individuals in the heavy group are attempting to make.

Heavy teen-age boys had fewer calories at breakfasts (−10 per cent) and snacks (−17 per cent) than had the medium boys of this age. Heavy teen-age girls had fewer calories than had the medium girls at breakfast (−8 per cent), lunch (−10 per cent), and snacks (−23 per cent); heavy girls below 12 obtained 15 per cent fewer calories at snacks than did the medium girls. Heavy children, in most age-sex groups, did not have, or did not record, as many calories from snacks as did others. The chief differences in meals were at the mean daily nutrient content was equivalent to 100 per cent or more of the Recommended Dietary Allowances of the NRC in all respects; Class II, those with diets in which some nutrients were present in amounts less than 100 per cent of the Allowances, but none less than 67 per cent;

TABLE 4

Distribution of the very heavy and obese children among three dietary classifications

DIETARY CLASS	NUMBER OF BOYS	PERCENTAGE DISTRIBUTION OF OVERWEIGHT BOYS	PER CENT OF OVERWEIGHT BOYS IN EACH CLASS*	NUMBER OF GIRLS	PERCENTAGE DISTRIBUTION OF OVERWEIGHT GIRLS	PER CENT OF OVERWEIGHT GIRLS IN EACH CLASS*
I†	19	29.2	13	11	10.8	14
II‡	24	36.9	9	41	40.5	15
III§	22	33.8	12	49	48.5	20

* These are the percentages of all sample children in each dietary class (I, II, and III) who were overweight.

† All nutrients in mean daily intake in amounts equal to or exceeding the NRC Recommended Dietary Allowances

‡ At least one nutrient in mean daily intake less than 100 per cent but none less than 67 per cent of the Allowances

§ At least one nutrient in mean daily intake less than 67 per cent of the Allowances

Class III, those with diets in which at least one nutrient was present in less than 67 per cent of the Allowances (1953 revision). See table 4.

The percentage distribution of the overweight boys among the dietary classes I, II, and III was not markedly different (approximately one-third in each class), and the percentages of boys in each class who were overweight were similar (13, 9, and 12). The situation differed for girls. Fewer of the heavy girls were in Class I than in Class III (10.8 versus 48.5), and the percentage of overweight girls was less in Class I than III (14 versus 20 per cent).

Diets of Class I were considerably higher than were those of Class III in mean daily food energy and nutrient value. It would, therefore, seem that, for girls, occurrence of overweight was much greater in the limited than in the liberal dietary group. This observation, with the preceding one, that the mean calorie value of diets of the overweight teen-age girls was significantly less than that of the girls of medium physique, suggested that the relationship of calorie intake and weight of girls is very complex.

Peckos (*8*) investigated the diets of 86 children classified in three groups according to body build. She observed that obesity and leanness cannot be accounted for by the same common factors in all children and that differences in body build in children are not a function of calories alone. Fry (*9*) obtained dietary data, as determined from 3- to 8-day records, for 36 obese children selected on the basis of "fat pads" or folds. Average calorie intake of these children was not higher than that of the control children.

Inactivity, another basic element in weight control, may play a dominant role in the production of overweight of children with seemingly low calorie intakes, and with generally poor diets. Mayer (*10*) has compared both the calorie intake and activity in carefully paired groups of obese and normal-weight school girls. The obese group was much less active than was the non-obese group. The time spent by the obese group in sports or any sort of exercise was less than half of that spent by the thin girls. Calorie intakes were generally larger in the non-obese than in the obese group. Bruch (*11*) also observed that inactivity was characteristic of the majority of the 160 obese children she had studied.

The interaction between good diets, health, and interest in play and recreation prompts one to speculate that the liberal diets of Group I are conducive to maintenance of good physique among children and that apparently excessive calorie intakes are soon worked off by healthy, well-nourished children.

Martin (*12*) states:

> Too much food, however nutritious it may be, leads to overweight. It is rare, however, for the normal child to take on excess weight if the diet is simple, wholesome, and well provided with essential nutrients.

Our observations in Group I would seem to support this thesis. On the other hand, the inadequate low-calorie diets were actually less effective than were the liberal diets in helping girls to achieve normal weight.

The percentage of overweight was higher for girls after age 12 than before. An "age tendency" in the development of overweight among girls is a rather commonly accepted concept. When only those girls with liberal diets (Class I) were considered, the occurrence of overweight was not significantly greater after 12 than before (15.7 versus 12.7 per cent). But when only the girls with relatively poor diets were considered (Class III), the difference before and after 12 was marked (15.7 versus 24.5). The so-called "age tendency" toward overweight in girls may not be inevitable but an outgrowth, direct or indirect, of the nature of the diet. This point would merit further consideration.

Summary

In a state-wide sample of Iowa school children, almost 11 per cent of the boys and 17 per cent of the girls were very heavy and obese. These children were considerably heavier than were those of the medium physique but were almost the same in height. Few differences were noted between the overweight and the medium-weight children as regards hemoglobin concentration in the blood or serum concentrations of ascorbic acid, carotenoids, and serum alkaline phosphatase.

Lower mean calorie and nutrient intakes were reported by the older girls in the overweight group than by those of medium build. Differences among the nutritive values of diets of the boys of the two groups were not consistent. Some differences in the use of foods and the distribution of calories among meals and snacks were noted.

In the group as a whole, overweight was most prevalent for girls of 12 and older, but when the nutrient intake was liberal, overweight was not conspicuous in this age group. Further research concerning the interaction of age, physique, and the quality of the diet seems warranted. This

study points to the particular need of nutrition education among overweight children.

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Tentative Program—47th Annual Meeting, AHEA
Washington, D. C.

Monday	**Executive board meeting**
June 25	**State presidents' and councilors' unit of AHEA council**
	Evening—Special meetings of committees and sections' officers and committees
	Registration downtown at Statler Hotel
Tuesday	**10:15 a.m.—General session—Meeting Our Professional Responsibilities**
June 26	**Afternoon—Visit exhibits; college club plans tentative**
	8 p.m.—AHEA business and council meeting
Wednesday	**Honorary society breakfasts: Phi Upsilon Omicron and Kappa Omicron Phi**
June 27	**9 a.m.—Eye opener**
	10:15 a.m.—Professional sections: elementary, secondary, and adult education; home economics in business; home economists in homemaking; research
	10 a.m.–1:30 p.m.—Professional trips
	2–4 p.m.—Professional sections: colleges and universities; Extension Service; institution administration; social welfare and public health
	2–5 p.m.—Professional trips
	8 p.m.—General session—Increasing Our World Understanding
	9:45 p.m.—Reception
Thursday	**Honorary society breakfast: Omicron Nu**
June 28	**9 a.m.—Eye opener**
	10:15 a.m.—Subject-matter sections: art; family economics and home management; textiles and clothing
	10 a.m.–1:30 p.m.—Professional trips
	2–4 p.m.—Subject-matter sections: family relations and child development; food and nutrition; housing and household equipment
	2–5 p.m.—Professional trips
	8:30 p.m.—Evening program at Carter Barron Amphitheater
Friday	**9 a.m.—Eye opener**
June 29	**10:15 a.m.–12 noon—General session—Looking Ahead with the American Family**
	12 noon–1 p.m.—AHEA business and council meeting
	Plans pending for remainder of afternoon
Saturday	**Executive board meeting**
June 30	**State presidents' and councilors' unit of AHEA council**
	AHEA headquarters will be open to visitors throughout the week.

Some ingredients of successful college teaching form the basis for this study. The findings offer clues for evaluating and improving teaching in the classrooms and laboratories of our higher institutions.

Teaching Methods in Non-Laboratory Classes

Dorothy M. Lucke

Dr. Lucke is associate professor of home economics at Northern Illinois State College, DeKalb. This article is based on the thesis for her doctor's degree in home economics education awarded by Pennsylvania State University in 1955.

COMPLAINTS about college teaching methods are not new. College students, professors, and administrators of former times as well as today have been and are concerned about college instruction. References to complaints appear in books such as *Academic Procession* [1] and *The Art of Teaching* [2] and in professional journals.

The problem as stated for this study was *An Analysis of Teaching Methods in Fifty Undergraduate Non-Laboratory Classes at The Pennsylvania State University.* It was believed that such a study would enlarge the picture of the kind of instruction that takes place in college classes and might show positive as well as negative aspects concerning college teaching methods.

Procedure

The procedures used to carry out this study involved obtaining permission to make the study, selecting the sample, formulating instruments to gather reasonably valid data, and administering those instruments.

Permission to solicit co-operation from 50 instructors in the various colleges of the university was obtained from deans or assistant deans and heads of departments. Some college staffs were informed of the study at staff meetings, and names of instructors who volunteered to co-operate were obtained at that time. In other colleges, heads of departments suggested instructors as possibilities for volunteers to co-operate in the study.

It was not possible to control the sampling of instructors. Only one aspect of their formal educational background was investigated, that is, whether or not the instructor had had training in professional education courses in teaching methods. The sampling included 25 instructors who had had such training and 25 who had not. An endeavor was made to obtain volunteers representing all colleges of the University. This was accomplished except for one college whose course offerings and class enrollments did not fit the specifications of the study. These limitations stated that classes to be observed were to be undergraduate classes having no scheduled laboratory work in connection with them. The class enrollment was to be no less than 10 students nor more than 40. The time indicated for class visitations was between February 15 and May 21, 1954.

To obtain reasonably valid data for analyzing the teaching procedures in certain classes, three means were utilized: the investigator's personal observations of the teaching procedures, student opinions, and personal interviews with the co-operating instructors.

Before any instruments were designed to gather data, reports of newer educational theories and educational research concerning teaching methods were studied. Devices such as questionnaires, student rating forms, check lists, anecdotal record sheets, and interview forms used in studies about teaching effectiveness were investigated. The following instruments were then constructed: a student "opinionnaire," [3] a teacher-observer rating form, and the interview form.

The opinionnaire consisted of ten items with four categories each for rating the instructor's teaching methods, and a set of directions for using

[1] ERNEST EARNEST. *Academic Procession.* New York: The Bobbs-Merrill Co., Inc. (1953), p. 23.

[2] GILBERT HIGHET. *The Art of Teaching.* New York: Alfred A. Knopf (1952), p. 81.

[3] Copies of the opinionnaire are available from the author for 15 cents.

the form. The following items appear on the opinionnaire in this order:

1. Course objectives
2. Course activities
3. Student-instructor planning
4. Expression
5. Speech mechanics
6. Presentation of subject matter
7. Knowledge of subject
8. Effective guidance for learning
9. Student-instructor relationships
10. Evaluation of achievement

The teacher-observer rating form was patterned after the opinionnaire.

The interview form consisted of open-end questions designed to obtain the instructor's opinions regarding teaching methods. These instruments were submitted to the writer's graduate committee for criticism, after which they were further refined, tested, and improved. This was done to establish the validity of the instruments and to increase their reliability.

In administering the instruments, the teacher-observer rating form was used first. The writer made three class visits to each of the co-operating instructors, a total of 150 visits. A complete anecdotal record was made during each visit. Later in the day this record was transferred to the teacher-observer rating form, which had been designed for that purpose. During the last ten minutes of each third visit, the student opinionnaire was administered. One thousand, one hundred forty-two opinionnaires were used by that many students in this study.

Before the opinionnaires were administered to a particular class, the instructor left the room. At that time he was given a set of questions proposed for discussion during the interview, which was to follow in a day or more. On the scheduled hour, the observer held an interview with each co-operating instructor. The purpose was to obtain the instructor's opinions concerning college teaching methods and to learn what factors he believed influenced his teaching procedures. In all, 50 interviews were held.

Findings

According to the findings of this study as indicated by the opinions of the observer, students, and instructors, course and class objectives were rated as being reasonably clear; these items were ranked high in importance by the instructors. Course activities, for the most part, were in line with the course objectives.

The instructors were rated less favorably on student-instructor planning than on course objectives and course activities. The instructor's responses to interview questions concerning course objectives showed that only 48 per cent included some student participation in the formal planning of course objectives and activities. However, these instructors mentioned observing students' needs and interests and following leads from students' discussions.

With three exceptions, co-operating instructors rated high in student-instructor relationships according to all opinions involved. Effective guidance for learning was another strong point with the majority of instructors.

From the evidence, most of the instructors were well versed in subject matter. Their presentations of the subject consisted chiefly of informal lectures and discussions with plentiful use of the blackboard and a varying amount of audio-visual aids. Plans for field trips were often included.

According to the students, more instructors rated lower on evaluation of achievement than on any other items. From further analysis of the data concerning that item, and from the number of students who inquired of the writer the meaning of it, it appeared that some students did not understand evaluation as defined on the opinionnaire. The observer made no rating on that item because in the majority of classes visited there was little opportunity to notice how a student's achievement was evaluated.

For the most part, the instructors associated evaluation of achievement with grading. Several evidenced dissatisfaction with grading as it is now carried out. Sixty-four per cent of the instructors did not encourage student participation in evaluation, although a number of instructors indicated that they allowed students in graduate classes to help with student evaluation. Only one of the 50 instructors used tests alone as a basis for grading.

With few exceptions all the instructors received a good rating on expression and speech mechanics. The observer's and students' opinions on these two items were remarkably similar.

The responses of instructors to the interview question concerning evaluation of their own teaching methods showed that they believed this was an important consideration and one to which more time should be devoted. Most of them believed that they performed self-evaluation through analyzing their students' reactions to the classroom procedures.

Concerning the importance of factors influenc-

ing their teaching methods, the instructors indicated that the greatest single influence was their former teachers. These instructors believed that they adopted from their former teachers something of techniques they considered favorable to learning and rejected methods they disliked.

Thirteen of the 25 instructors who had had professional education courses in teaching methods believed that all these courses were helpful. Nine remarked that one or two of the courses were helpful, and three said that none was of value to them. The chief complaint from the majority of the instructors was that there is too much repetition in education courses.

In regard to informal influencing factors, many instructors believed it was hard to pinpoint what influenced their teaching methods. Factors given precedence were: informal contact with fellow instructors and business and professional conferences, reading technical and professional journals and magazines, and observing their own children's growth and development. In the opinion of the majority of the instructors, reading books, listening to the radio, and watching television, movies, and plays were believed to have little influence on their teaching methods.

Briefly stated, the quality of teaching, as observed and analyzed in this study, was such as to stimulate and promote learning. According to the opinions of the observer and students, the teaching methods of 96 per cent of the instructors were thus classified. The majority of the instructors believed in having course objectives, making them clear to the students, and developing class activities in line with the objectives. Less emphasis was placed on student-instructor planning and student participation in evaluation. Instructors' expression, speech mechanics, knowledge of subject, and presentation of subject matter received favorable ratings in most cases. Effective guidance for learning was evident in all but a few classes. Student-instructor relationships appeared informal and friendly. The enriching of professional education courses in teaching methods was emphasized, and confidence in the value of such courses was indicated by a number of the instructors. As influencing factors on instructors' present methods of teaching, former teachers rated high. Also informal contacts were believed to have some influence.

Conclusions

This study showed that the college teaching observed at The Pennsylvania State University was considered effective according to the opinions of the teacher-observer and the students in the classes observed. These opinions were measured by the criteria set up in this study. Interviews with the co-operating instructors helped to substantiate these opinions. From the standpoint of future research along similar lines several factors appear to be important.

Care was taken to approach the college instructors in such a manner that their co-operation was voluntary. Only 3 out of the 53 instructors who were approached refused to co-operate. The difficulty lay in finding undergraduate, non-laboratory classes of limited size that met at times that did not conflict with the writer's available schedule for observations. During the class visits, the observer tried to appear unassuming but interested; the hours of class meetings were observed on time; and the interviews with instructors were scheduled for the hours designated by them.

Instructors may object to co-operating in studies which involve prolonged interruptions in their classes. For this investigation there was no disruption of classes except for the forfeiture of ten minutes of class time at the end of the observer's third visit when the student opinionnaire was administered. Since previous arrangements had been made with the instructors for those visits, their classes were planned accordingly. None of the instructors appeared to resent this procedure.

The instruments used in research studies for measuring teacher effectiveness are varied, but in all of them there lies the problem of objectivity. It is a complex problem and admittedly one that necessitates continued research. In this study many of the students' opinions gathered from ratings given in the opinionnaires showed a striking similarity to those evidenced by the teacher-observer on her rating form. This evidence supported the objectivity of these instruments. It is believed, however, that they could be made more objective by continued refinement after further testing.

An opportunity for free responses from students was presented on the opinionnaire in form of a statement to the effect that any additional comments concerning their teacher's methods could be written on the back of the page. Although the students taking advantage of this were relatively few (54 out of 1,142 students wrote additional comments), most of these remarks were meaningful. More emphasis could be placed on encouraging this type of response by permitting space for additional comments below each item on the opinionnaire.

The interview form, in the nature of open-end

questions, was administered in an objective manner, and the exact comments of each instructor were recorded. Conclusions concerning his opinions were taken directly from his responses to the questions. These verbalizations, for the most part, appeared to strengthen the reliability of students' and observer's opinions concerning the instructor's teaching methods.

The many criticisms concerning college teaching, such as instructors' reading to students from "musty, old notes," failing to give intelligent explanations of material being taught, failing to stimulate interest and to broaden students' intellectual horizons, acting in an overbearing manner, and being intolerant of students' points of view, were not wholly substantiated by the observations made in this study. Certainly none of these criticisms could be applied generally to the co-operating instructors, and only a few were warranted for several instructors.

The conclusions from this study present a picture of strengths in college teaching rather than weaknesses. Eight hundred eighty-eight or 78 per cent of the students in 39 different classes rated their instructors as doing the kind of teaching that stimulated learning; 221 or 19 per cent of the students in 10 different classes rated their instructors as promoting learning; and 33 or 3 per cent of the students in 2 different classes rated their instructors as obstructing learning. Based on 3 visits made by the writer to each of these 50 classes, 40 of the instructors in these classes (total enrollments, 916 students) were rated as stimulating learning; 8 of the instructors in these classes (total enrollments, 171 students) as promoting learning; and 2 of these instructors whose class enrollments totaled 55 students, as obstructing learning.

Recommendations for Utilizing the Findings

Based on the findings of this study, the following recommendations are made:

1. Instructors could use the revised student opinionnaire as one means of evaluating their teaching methods.

2. More college instructors need to understand the possibilities of student participation in planning course objectives and activities.

3. Many college instructors need to change their concept of evaluation from that of "grading" to that of "guiding student progress toward goals"; grading is only a part of this process.

4. Preparation for college teaching should include effective courses in educational methods.

5. More college teachers need to understand the nature of professional education courses in teaching methods.

6. Repetition in education courses should be avoided.

7. Many instructors in educational methods courses need to be more adept than they now are in practicing effective teaching procedures.

8. College teachers need to become sensitive to the fact that their teaching procedures have a significant influence on the methods of future teachers.

9. Students need to be given more opportunity and encouragement in helping to plan course objectives and activities.

10. Students need to learn more about evaluation than they now know and need to be included in planning self-evaluation and class evaluation.

11. Student participation in class activities needs continued emphasis.

Recommended Research

The writer believes that the lack of research in what constitutes effective teaching at the college level together with the findings of this study indicate need for more research regarding college teaching. The following are some recommendations for further investigations:

1. Co-operative research to determine what constitutes effective teaching at the college level

2. Co-operative research to devise more valid and reliable instruments with which experiments on teaching procedures could be evaluated

3. Further studies to improve the reliability and validity of the instruments used in this study

4. Carefully planned investigations to indicate the degree of student participation advisable in planning course objectives and activities for college classes

5. Controlled studies to measure effectiveness of student participation in evaluation of student achievement

6. Studies to improve the present college grading system

7. Controlled studies to indicate how much courses in teaching methods influence an instructor's classroom procedures

8. Research to determine how to make educational methods courses more effective

9. Research to determine expressed need of college teachers for courses in teaching methods

10. Studies to determine amount of consideration college teachers give to their teaching methods

New Industry Research in Textiles

Among few of the products we use in our daily living are there more constant changes than among the textile products we buy, wear, and use in our homes. New developments are constantly expanding our range of choices, making our clothes more comfortable and attractive, and lightening our tasks of caring for textile products. Behind these developments lie many years of research on fibers, fabrics, and finishes. In the following symposium representatives of industries concerned with the new synthetic fibers, with acetate, rayon, cotton, and wool, describe some of the current commercial research on these fibers and the fabrics made from them. As a supplement to this discussion, JOURNAL *readers may wish to refer to the abstract of a doctoral thesis on "An Analysis of the Silk Industry" by Rose Padgett on page 215.*

SYNTHETIC FIBERS ..... J. B. Quig

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For centuries, the textile industry has supplied the consumer with tens of thousands of items ranging from heavy industrial fabrics to delicate laces and the sheerest of ladies' hose, using three raw materials in the form of four types of fibers: cotton, linen, wool, and silk. Cotton and linen are characterized by great strength but little elasticity or resiliency. At the other end of the spectrum was wool, with a great deal of elasticity and resiliency but relatively little strength; and, in the middle of the spectrum, a small amount of silk was available, possessing high strength and an intermediate amount of elasticity. The ingenious utilization by man of these four natural fibers is so familiar that it is usually forgotten that the everyday uses of such fibers are not those for which they were designed by nature.

To gain the proper perspective of the status of natural fibers versus synthetic fibers, one must consider that application research involving cotton, wool, and silk has been in process for a thousand years or more and is still continuing. Nylon, Orlon,[1] Dacron,[1] and other fibers with new and unique functional properties have been added to our textile economy in the short span of 15 years. In fact, Orlon acrylic fiber and Dacron polyester fiber are infants in the fiber family. These synthetic fibers and others represent an answer to the question of how the textile industry is going to meet the challenge of creativity and the necessity for the production of new and different fabrics to meet the demands created by a widespread increase in our standard of living and by a rapidly increasing population. Sociological changes are represented by changes in the manner of living of our people as, for instance, the necessity for easier living in servantless homes and in those in which business careers are pursued by both parents; the steady trend to lighter weight clothing as homes, offices, and automobiles tend to be universally heated; and the widespread adoption of sports clothes—a by-product of increased leisure time.

Textile research has demonstrated that the above reasoning is sound; but, after exhaustive fabric research, it has come to a most important resolution. I refer specifically to the present realization that the adaptation of synthetic fibers, possessing new and radically different properties, is a task of equal magnitude to the synthesis and production of the fibers themselves.

In the last five years, research has demonstrated that the unique functional properties conferred on fabrics by synthetic fibers are an important adjunct; but these properties must not be obtained at the expense of aesthetic properties. The consumer, for example, wants fastness to light and washing, dimensional stability during wearing and laundering, quick drying, ability to hold press and shape, the great strength and elasticity and durability of nylon, the resistance to and recovery from wrinkling of Dacron, and the warm, soft hand

[1] Du Pont trademark.

and friendly bulk of Orlon; but he insists that these desirable properties not be obtained at the expense of appearance, color, hand, and drapeability.

To state the matter briefly, textile research has learned that it is absolutely necessary to combine aesthetic properties with functional properties, particularly in apparel fabrics. This is the outstanding change in the thinking of textile research which has occurred in the past few years. This resolution, undoubtedly, will accelerate the development of better and more versatile fabrics than were produced in the early stages of development.

This integration of ideas has resulted in a better assessment of the magnitude of the research task involved. Also, the fiber producers now recognize that the facilities of the existing textile research laboratories are inadequate. The vast amount of research to be done has stimulated the building of new laboratories devoted to the following categories of research:

1. Development of the technology for the production of aesthetic fabrics which will give the maximum utility for modern living
2. Discovery and development of entirely new fabrics and new end-use opportunities for synthetic fibers
3. Carrying-out textile research on new fibers to determine whether creativity can be further extended to satisfy the sociological and technological needs of our progressive civilization

ACETATE AND TRIACETATE

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In discussing new research on acetate fibers, yarns, and fabrics, it becomes necessary to distinguish between the secondary or regular acetate, which has been manufactured commercially since 1924, and the triacetate (Arnel),[2] which has been produced commercially for a little more than a year.

New research on acetate—at least as far as Celanese Corporation of America is concerned—has proved particularly fruitful in the triacetate type of fibers, yarns, and fabrics. Indeed, research has proved that this fiber can be used to produce fabrics which have essentially all of the requirements for today's way of living.

What are the wants of today's American textile consumer? A few of the most important are:

1. *Fabrics which have a wide range of bright, clear colors but which can be washed in the automatic washer, set at high or low temperature*—Research on triacetate dyes and fabric treatments made it possible for commercial dye-houses to produce a wide range of fabrics that meet this set of requirements.
2. *Fabrics which need little or no ironing and which dry quickly*—Again, research on fabric design and on heat-treatment procedures have produced many so-called wash-and-wear fabrics with quick-drying characteristics.
3. *Fabrics which do not shrink or stretch*—Heat-treatment procedures and fabric construction have resulted in fabrics whose dimensional changes are almost immeasurable.
4. *Fabrics which do not require special temperature control in ironing*—Heat-treating research has produced triacetate fabrics which can be ironed in the same general manner and at the same temperature settings as cotton.
5. *Fabrics which can be worn on damp, hot days with a minimum of wrinkling or mussing*—New research on fabric construction and heat-treating procedures have developed fabric from triacetate with extraordinary wrinkle-resistance even at high humidities and temperatures.
6. *Fabrics with durable pleats and embossing*—Research on the behavior of Arnel triacetate under heat treatment and stabilizing has resulted in the commercial production of pleated fabrics and garments durable to many washings.

While the textile consumer wants fabrics with the above characteristics, she appreciates and wants styling effects even more. Research on triacetate has permitted a wide variety of styling effects through its cross and union dyeing characteristics, its special behavior in combinations with cotton, and its inherent blendability with natural and other man-made fibers.

Research on triacetate has resulted in fabrics which meet the requirements of the textile consumer singularly well. Before the consumer can benefit, research and development efforts must be made so that these procedures and techniques are used to produce commercial quantities of these

[2] Trademark, Celanese Corporation of America.

fabrics. This step is under way, and volume production of fabrics and garments with the aforementioned characteristics is taking place.

In the meantime, research goes on—not on just fiber or fabric construction, or on dyeing and finishing; this new research includes investigation at all four of these levels. Problems must be overcome on all fronts; thus, new research on triacetate is directed toward even better fabrics—fabrics with improved strength, sun-light and gas-fading resistance, and at lower costs. Also being developed are styling effects suitable only with this fiber.

Of the acetates, results on the triacetate have been the most fruitful. Nevertheless, research on secondary or regular acetate has not diminished but has continued more vigorously in the fields of new dyes, finishing, and mechanical techniques rather than in the fundamental change of fiber properties. New pigments for use in the solution-dyed acetate have been developed, resulting in even greater fastness for this type of acetate product, as well as wider color ranges. Mechanical techniques for bulking acetate filament yarns so as to give a spun yarn appearance have resulted from research in this field. This is a new and promising trend. The bulking of filament yarns produces textiles which have the combined advantages and desirable characteristics of both spun and filament fabrics. New dyes with somewhat greater wash-fastness and light-fastness have been developed, and research concerned with commercialization of these improved dyes will continue.

Considerable research effort is being extended on the utilization of acetate in blends with other fibers. A notable commercial success has been the large-scale use of acetate and cotton combinations.

RAYON

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Fibers and Yarns

Continuing active research by the rayon producers has resulted in constant improvement in rayon staple and continuous filament yarns. Outstanding among the advances recorded during the past ten years are higher dry and wet tenacities—of particular interest for industrial applications where yarn strength is an important factor. High-tenacity rayon tire cord yarns are today contributing safety and durability to passenger car tires which meet the exacting demands of high-speed driving. No small part of the freedom from concern about frequent punctures or blowouts once encountered can be attributed to the reliability of rayon tire cord. Similar yarns are finding their way into industrial fabrics where high strength and low cost are important considerations.

For use in apparel and household fabrics, the rayon yarns being produced today are more uniform in dyeing characteristics than they were years ago, and many novel textures and effects are possible through the wide variety of types of fibers and yarns now available. "Solution-dyed" fibers and yarns, in which colored pigments are incorporated in the spinning solution prior to extrusion to form the filaments, are receiving wide acceptance in fabrics where the utmost in colorfastness is desired for apparel, upholstery, and drapery materials. Several years ago a durable crimp was imparted to rayon staple for use in apparel fabrics where more wool-like loft was desirable.

Very fine denier filaments have been developed to impart luxurious softness and fullness of hand, and the introduction of yarns with coarse denier filaments permitted the creation of new dress fabrics with a crisper texture. "Thick-and-thin" continuous filament yarns have become available and yield interesting surface effects. One of the fiber producers recently introduced a wide range of nubby and flake novelty yarns to enable the designers to achieve effects heretofore obtainable only through the use of more costly silk yarns.

Originally conceived as a means for imparting a high degree of bulk and loft to the newer synthetics, a novel mechanical process for forming a series of loops and whorls in continuous filament rayon yarns has been developed. Just a short time ago, several unusual upholstery fabrics containing such "solution-dyed" bulk yarns were offered to the decorative fabrics trade.

During the past few years rayon tufted carpeting has shown a tremendous growth in popularity. The particular suitability of spun rayon yarns for the low-cost tufting operation and the availability of special heavy denier fiber make possible the marketing of low-cost, serviceable, and attractive rugs and carpets. In addition to making more rigid coarse fibers for this purpose, the rayon producers also brought out a special carpet fiber with a circular cross section and a higher delusterant content to reduce soil retention of the finished product. Since rayon is pure white in its original state,

colors are brilliant. Controlled fiber lengths and firm anchoring of the pile have eliminated the shedding problem common to certain types of wool carpeting, and the build-up of annoying static electricity charges is not encountered in rayon constructions.

Finishes

Perhaps the foremost technological improvement made in the finishing of rayon fabrics in recent years is the achievement of stabilization against shrinkage or stretch. While it has been known for many years that rayon fabrics could be dyed or printed to provide a high degree of colorfastness in laundering, it is only during recent years that research workers have been able to offer chemical finishes to insure complete washability without shrinkage or stretch. Thanks to research, too, shrink-resistant tricot is on the market.

Crease-resistant finishes are not new to rayon, and it is most receptive to such chemical treatments. Early durable stabilizing finishes did not combine well with the resins required to impart crease-resistance or a "full" hand, but such combination treatments are now commercially available. For increasing their serviceability, many apparel fabrics are now being given spot-resistant finishes which repel most common non-oily stains. Rayon carpeting, too, is now being improved by the addition of soil-retardant chemicals at the time of manufacture.

Following the growing trend and demand for garments which require a minimum of care in home laundering, several dyers are offering special finishes which help make rayon fabrics retain less water during laundering, facilitating drying. This attribute, along with improved wrinkle-resistance, minimizes the amount of ironing required to restore rayon garments to their original fresh appearance.

Rayon, the first man-made fiber, is still the leader in poundage consumed, and continuing research is certain to help it retain its leadership for many years to come.

COTTON ..... Nelson Getchell

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Current cotton research covers three levels of the industry—fiber production, textile processing, and fabric finishing. Efforts are directed toward lowered costs, improved quality, and new products desired by the consumer. This concerted approach has resulted in today's new "miracle" cottons and many other improved cotton products. The future looks even more promising!

Grass-Roots Research

Cotton, along with other farm crops, has made tremendous advances through research since World War II. Improved fertilization, new herbicides, chemical insect control, and disease-resistant plants are a few of the more notable developments. Mechanization has revolutionized cotton cultivation, and approximately a third of the crop is machine harvested today, as against only 3 per cent in 1947-48. Along with the increased mechanization have come other improved practices, such as better ginning, scientific fiber testing, and more efficient merchandising.

Processing Research

Like other industries, the cotton textile mills have moved toward greater efficiency. New machines produce more uniform yarns and fabrics at higher rates of production. Progress in instrumentation has freed the manufacturer from complete dependence on human judgment and raised the level of quality control. Instruments now in common use measure fiber fineness and maturity, staple length, color, and grade. Electronic devices record yarn uniformity and count imperfections faster than the eye can follow.

Chemical Finishing

Properties that can be imparted to cotton through the application of chemicals are of immediate interest to the consumer. The new concept of chemical finishing, whereby cotton cellulose is reacted with various chemicals to produce new and desirable fabrics, has brought major changes to the cotton finishing industry. Many new finishes, now in full commercial production, have achieved wide consumer acceptance. Many others still in laboratory or pilot plant stages of development form the basis for the new cottons of tomorrow.

Crease-resistant, washable cottons are the result of many years of research. Resins of the urea and melamine formaldehyde type internally polymerized and cross-linked by heat within the cotton cellulose molecule give cottons a resilient, wool-

like feel and cause creases and wrinkles to disappear overnight. Cotton fabrics with interesting embossed or glazed surfaces, durable to laundering, are also achieved through resin treatment. Current research studies, on both the fundamental chemistry of cotton and resins, and on fabric construction and styling, aim at still better wrinkle-free performance and newer and more attractive color and pattern effects.

Wash-and-wear cottons, the year's most noteworthy textile development, keep step with the modern trend of easing the homemaker's tasks. Combining the optimum in resin treatments and fabric construction, "minimum care" cottons are fully washable in home laundry equipment and require little or no ironing.

Heat- and mildew-resistant fabrics, the result of research on the chemical modification of cotton, will soon be available to the consumer. Partially acetylated cotton, a development of the Southern Regional Research Laboratories of the U. S. Department of Agriculture, already is in limited commercial production for such items as ironing board covers, laundry fabrics, and shoe linings. The recent discovery that vat-dyeing combined with acetylation greatly increases the weather resistance of cotton holds considerable interest for users of awnings and other outdoor fabrics.

Cyanoethylated cotton, named Azoton by its developers at the Institute of Textile Technology, has reached the final stages of pilot plant evaluation. In addition to improved heat- and mildew-resistance, Azoton can be dyed with wool dyes. Even newer chemical modifications, such as aminization and phosphorylation, offer the consumer still other valuable properties as they move forward from the present test tube experiments.

Soil-resistant finishes for cotton have recently been introduced by two leading chemical manufacturers. Of major importance to rugs and carpets, these finishes are also applicable to draperies, upholsteries, and other fabrics that are difficult to launder. These finishes, which delay the first appearance of dirt and make cleaning easier, work on the principle of blocking the soil from the fiber surfaces with minute colorless particles. Resin-type water repellents and silicone finishes, fast to laundering and dry cleaning, have also been developed to give cotton stain-resistance.

Cotton rugs and carpets with their bright colors and soft texture provide the homemaker with new decorating possibilities. Scatter rugs and medium-sized cotton carpets are completely washable in home or commercial laundry equipment. New methods and machines, the result of recent research sponsored by the USDA, have solved the problem of "location" cleaning. Wall-to-wall cotton carpeting can now be cleaned satisfactorily without removal from the floor.

Increased wear, greater colorfastness, and softer texture for cotton denims are the result of treatment of warp threads with rubber latex compounds prior to weaving. Fabric abrasion resistance improves still further after each laundering. Better colorfastness makes it possible to trim denim dresses, playclothes, and sportswear with other materials without danger of color transference.

Fire-retardant treatments for cotton, durable to laundering and drycleaning, have recently been prepared by U. S. Department of Agriculture chemists. Vital for military purposes, fire-resistant finishes may eventually prove useful for certain household and institutional fabrics.

WOOL. . . . . Gerald Laxer

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In order to maintain and improve the competitive position of wool in the international fiber economy, the wool-growing interests throughout the world have recognized that intensified scientific effort is a necessary step in obtaining their goal. Wool research today is greatly different in scope than it was 20 years ago when most of the effort was directed toward an understanding of the structure and behavior of the fiber itself. Fundamental fiber structure and behavior studies are still being carried out, since wool is the most complex of the textile fibers. However, with the advent of scientific discoveries in other fields and new tools for exploration, wool research in both the fundamental and applied areas has been greatly expanded. Some idea of the wide scope of wool research today can be obtained from the five-volume *Proceedings of the First International Wool Textile Research Conference* held in Australia during August and September, 1955. More than 150 research papers and lectures were presented by research workers in the fields of protein chemistry and physics, textile technology, agricul-

tural and veterinary science. The *Proceedings* reveal that the areas and objectives of wool research today are:

Production research—To increase the amount and quality and decrease the cost of wool production by genetic, animal health, pasture improvement, and pest eradication studies.

Processing research—(1) To assess quantitatively which characteristics of the wool fleece and wool fiber are important and what are their desirable levels in manufacture and in the performance characteristics of a variety of wool textiles by objective evaluation of lots of wools with known fleece and fiber characteristics; (2) to shorten and to develop more efficient means of processing wool fibers into fabrics, without causing any reduction in quality, by fundamental studies of the basic principles of the various wet and dry manufacturing processes

Fundamental fiber research—To obtain more complete information about the structure and behavior of keratin fibers by chemical, biochemical, physical, and morphological studies.

Fiber and fabric modification research—To enhance the usefulness of certain types of wool fabrics without altering quality so that they meet specific end-use requirements (mothproof, shrink-resistant, permanently pleated, and so forth) of the consumer by chemical and/or physical modification of fibers, fiber assemblies, and fabrics

There is no clear-cut line of demarcation between these fields of wool research, since discoveries in one area usually throw light on some problems in the remaining areas.

Production Research

Production research in the primary industry has played an important role in the past ten years in increasing the amount of world wool production by approximately 500 million pounds. Some of the principles and techniques that have come out of a vast and continuing biological research program and which are contributing constantly to increasing wool production are:

1. Selective sheep-breeding programs for increasing the amount of wool shorn from the sheep
2. Discovery and replacement of certain deficient elements, such as copper, cobalt, and molybdenum, in the soil of large sheep-grazing areas for eliminating certain sheep diseases and wool faults and for increasing the rate of necessary plant growth
3. Use of new surgical techniques, insecticides, and medicinal preparations for eliminating external and internal sheep parasites
4. Use of the myxomytosis virus as a specific agent for almost completely eliminating the Australian rabbit as a competitor for pasture
5. Use of superphosphate fertilizer and more rapidly growing and more nourishing grasses and clovers for increasing the sheep-carrying capacity of pastures

Processing Research

Processing research work aimed at quantitatively assessing fleece and fiber characteristics of importance in manufacture and in fabric performance has only been carried out systematically in the past few years. This is not surprising, for there is such a wide range of wool types available and the number of fleece and fiber parameters considered important are numerous and sometimes difficult to evaluate objectively. In order to study the effect of fleece and fiber parameters in manufacture and in fabric, wools with well-defined characteristics and suitable processing equipment must be readily available. In addition, new and complicated measuring devices as well as advanced statistical techniques are often required. However, initial research efforts have proved successful. Using a merino wool, the relationship has been shown between fiber crimp frequency and worsted spinning efficiency and also between fiber crimp frequency and the hand of one type of worsted fabric. Work along these lines will be continued in close co-operation with sheep biologists and manufacturers, for results should not only prove useful to the manufacturer in the selection of wools for specific end-use purposes but also to the wool grower in his breeding program.

Abbreviated methods of manufacture as well as improved handling techniques are constantly coming out of fundamental research on processing. Typical examples are the Ambler Superdrafter and Raper Autoleveller which are already in widespread use for improved worsted spinning. New techniques for the emulsion scouring and for the solvent scouring of wool will result in less waste during subsequent manufacturing operations and in fabrics of higher quality.

Fundamental Fiber Research

Fundamental fiber research is directed toward elucidating the manner in which the wool fiber is put together from its basic chemical constituents up through its almost unique cellular structure. In

addition, such work attempts to explain the mechanical and chemical behavior of the fiber in terms of its molecular and cellular architecture. Clearly, it is impossible to mention even all of the *recent* developments in this broad field, but the following are noteworthy:

1. Eighteen amino acids which form the polypeptide chains of the wool protein have been identified and assessed quantitatively.
2. X-ray diffraction patterns and mechanical properties of the fiber indicate that the polypeptide chains are normally coiled in the form of helices, but the chains are capable of uncoiling under tension. Under normal conditions the chains can assume their normal configuration again when the tension is removed. This reversible phenomenon is responsible for the long-range elasticity of the wool fiber and this property helps to make wool garments resistant to wear.
3. The disulfide cross-link between polypeptide chains is of great importance in determining the chemical and physical behavior of the fiber, and it can be chemically modified in order to improve the fiber's resistance to chemical and biological attack.
4. The cortex or main body of a crimpy wool fiber is divided laterally into two distinct portions which differ chemically and physically. Along the main fiber axis, the two cortical sections are twisted around each other in a manner which bears a direct relationship to the crimp. Since one part of the fiber swells more readily than the other, changes in humidity cause the fiber to act in a manner similar to a bimetallic strip forcing it to take up again its curved form and so restore the crimp and bulkiness to yarns and fabric.
5. The outermost layer of the wool fiber consists of a very thin, non-protein material (epicuticle), which repels liquid water but permits water vapor to pass through it. This layer is principally responsible for the natural liquid water repellency and lack of wicking of wool fabrics. The cortex of the fiber, however, can absorb up to 30 per cent of its weight of water vapor without the fibers feeling wet. This combination of surface liquid water repellency and inside water vapor absorbency is one reason for the comfort offered by wool fabrics.

Fiber and Fabric Modification Research

The main objective of fiber and fabric modification research is to increase the usefulness of certain types of wool fabrics without altering their quality. The course of such work is guided by the discoveries in the field of fundamental fiber research. The following examples illustrate this point:

1. Felting shrinkage of wool fabrics is mainly due to the imbricated surface of the fibers which causes them to move preferentially in one direction when they are rubbed. The felting shrinkage of wool fabrics can be sharply curtailed or eliminated by modification of the surface of the fibers. Thus, practical antishrink processes, such as wet and dry chlorination, polymer deposition, oxidation followed by enzyme treatment, and others, have been designed to alter the surface of wool fibers and are widely used for woolen fabrics which are to be laundered.
2. The susceptibility of wool to biological attack, for example, by moth larvae and bacteria, is due to the lability of the natural disulfide cross-link in the wool protein. New chemical methods for stabilizing the disulfide cross-link and for otherwise cross-linking wool have been developed, and some of these are employed on a large scale for permanently mothproofing and rotproofing wool.

Finally it is noteworthy that all the modern techniques of mechanical processing, dyeing, and finishing which are employed for producing the wide variety of wool fabrics have been developed from an understanding of the fundamentals behind the chemical and physical behavior of wool fibers. Fundamental studies are continually pointing the way toward producing wool fabrics with new and improved properties.

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Homemakers, processors of lard and other cooking fats, and manufacturers of household appliances will find useful information in this timely study of the use of lard for deep-fat frying in the new home-size deep-fat fryers.

Decomposition of Lard in the Frying of French-fried Potatoes and of Fritter-Type Batters[1, 2]

Marian Bennion and Flora Hanning

Dr. Hanning is a professor in the department of foods and nutrition in the School of Home Economics at the University of Wisconsin, where Miss Bennion was a research assistant when this study was made. She is now a member of the faculty of Brigham Young University.

THE changes taking place in frying fats and the problems involved in deep-fat frying have been studied mostly on a commercial scale. The few reports of such experiments under home conditions reveal a surprising lack of recent information on small-scale deep-fat frying, much of the work having been done about 1919 with only one report since 1940. Studies simulating home conditions include the early work of McKee (*1*), who reported that fat absorption of doughnuts was influenced by the proportions of ingredients in the mixture. Woodruff and Blunt (*2*) investigated the decomposition of lard and cottonseed oil used for frying potato chips or a flour, baking powder, salt, and water mixture. These workers reported slightly more decomposition, as measured by increased free fatty acids and reducing substances and decreased iodine values, in lard than in oil for both foods.

In a study of changes in fats used for frying doughnuts, Morgan and Cozens (*3*) found that with additional frying time the free fatty acid content increased, while the melting points and iodine values decreased. Denton *et al.* (*4*) reported that the fat absorption of fried flour mixtures was affected by temperature of frying, type of formula, amount of manipulation of the batter or dough, and volume of the fried food. King *et al.* (*5*) found an increase in free fatty acids of lards and vegetable oils after frying about 4 kilograms of potato chips, but this value did not go over 0.88 per cent in any case. It was reported in this experiment that peroxide values were high enough in some cases to make fitness for use questionable, especially with lards. Thiessen (*6*) reported an increase in acidity and a decrease in iodine values and smoke points when doughnuts were fried in lard, vegetable oils, or hydrogenated fat with up to 18 hours of use. The free fatty acid content did not go above 0.755 per cent after 18 hours, however.

Lowe *et al.* (*7*) compared changes in lards, corn oil, and hydrogenated fat after cooking doughnuts or potato chips. After frying potato chips, the iodine number was lower; the free fatty acids, with one exception, were higher; and the smoke point was higher than after frying doughnuts. The cooking of doughnuts caused a greater discoloration of the fat than did the frying of potato chips. These workers reported that, in general, the smoking temperature varied inversely with the free fatty acid content of the frying fat. Peroxide values increased with use in the frying of doughnuts, the increase being more rapid at higher temperatures. Most of the lards reached peroxide values of from 9.5 to 15.7 after approximately 10 hours of frying.

The fatty acid content of lard and corn oil used for the frying of doughnuts or potato chips was studied by Chang *et al.* (*8*). These workers reported that corn oil showed a decrease in total unsaturation with the frying of potato chips. Changes in lard were negligible.

Improved processing techniques for lards and

[1] Supported in part by the Research Committee of the Graduate School with funds from the Wisconsin Alumni Research Foundation.

[2] Publication approved by the Director of the Wisconsin Agricultural Experiment Station.

other fats and concurrent development of small-size, convenient, and attractive deep-fat fryers for home use have encouraged the home preparation of more deep-fat fried foods, especially French-fried potatoes. The usefulness of lard as a less expensive frying fat might be improved if frying changes were better understood. The present study was conducted for the purpose of (1) comparing the changes in lard produced by frying potatoes or a fritter batter, and (2) determining the effect of various fritter batter ingredients on the decomposition of lard used for frying.

Experimental Procedure

Types of products fried. In Series I a comparison was made of batter and potato frying. Potatoes were fried in 500-gram lots at an initial temperature of 196°C for 11 minutes. A fritter-type batter was prepared containing all-purpose flour, sugar, tartrate baking powder, and salt, sifted together, and added to an egg and milk mixture. Each batch weighed 410 grams and was fried in 2 lots of 6 balls each at 190°±5°C for approximately 8 minutes.

In Series II the effect of modifications of fritter batter was studied. Continuous process lard was used for the following treatments:

1. Control batter (described above)
2. Batter containing no sugar
3. Flour, sugar, and water only

Lard from the retail market was used for treatments 4, 5, and 6 as follows:

4. Control batter (tartrate baking powder)
5. Batter with sulfate-phosphate baking powder.
6. Batter with no baking powder

Frying procedure and fat analyses. Lard [3] rendered by a low temperature continuous process was used for the frying in Series I and for treatments 1, 2, and 3 of Series II. Treatments 4, 5, and 6 of Series II were fried in lard purchased from the retail market. All lard used contained 0.05 per cent antioxidant (propyl gallate, butylated hydroxyanisole, and citric acid in propylene glycol). A household-type electric deep-fat fryer, 62 square inches top surface area, was used for all frying.

Samples of frying fat were withdrawn at intervals in Series I and II for determination of the following fat constants: peroxide numbers by the method of Wheeler (9), per cent free fatty acid calculated as oleic acid, iodine numbers by the method of Rosenmund and Kuhnhenn (*10*), and saponification numbers as given by Williams (*11*). An apparatus used for the determination of smoke points was constructed essentially according to specifications of the American Oil Chemists' Society (*12*).

Fat absorption was measured only in Series II by weighing the fat and fryer at intervals and calculating by difference an average absorption of fat per batch of batter fried. Crusts were removed from several batches of fritter balls and the fat extracted from them for determination of peroxide numbers.

Fat constants as affected by food fried
(Continuous process lard)

FOOD FRIED	PERCENTAGE OF FREE FATTY ACID	PEROXIDE NUMBER	IODINE NUMBER	SAPONIFICATION NUMBER	SMOKE POINT
kilograms					°C
Potatoes					
None	0.15	1.01	65.3	195.4	216
4.5	0.19	1.45	65.5		216
9.0	0.22	7.25	65.5	195.6	213
Batter					
Number of batches					
None	0.15	1.01	65.3	195.4	216
10	0.37	1.98	66.9		202
20	0.86	4.24	66.0	196.0	181

Results and Discussion

The data in the table show that the frying of batter caused a sharp increase in free fatty acid in comparison to little change produced by the potatoes. Although the peroxide values remained low at first for both potatoes and batter, the value

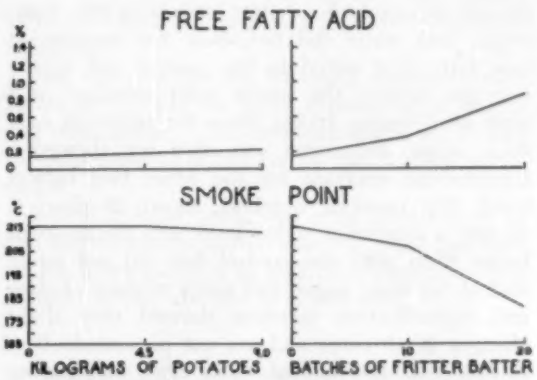


CHART 1. CHANGES IN PER CENT FREE FATTY ACID AND IN SMOKE POINT BY THE FRYING OF POTATOES AND FRITTER BATTER

[3] Appreciation is expressed to Oscar Mayer and Company, Madison, Wisconsin, for the supply of continuous process lard.

for potatoes later reached a higher level than did that of the batter samples. Iodine and saponification numbers appeared to be little affected. The smoke point was lowered markedly by the frying of batter but was affected much less by the French-fried potatoes. These data for per cent free fatty acid, smoke points, and peroxide numbers are represented graphically in charts 1 and 2.

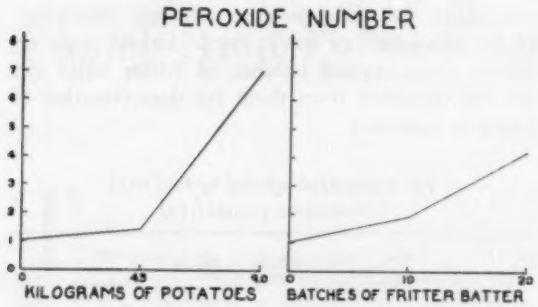
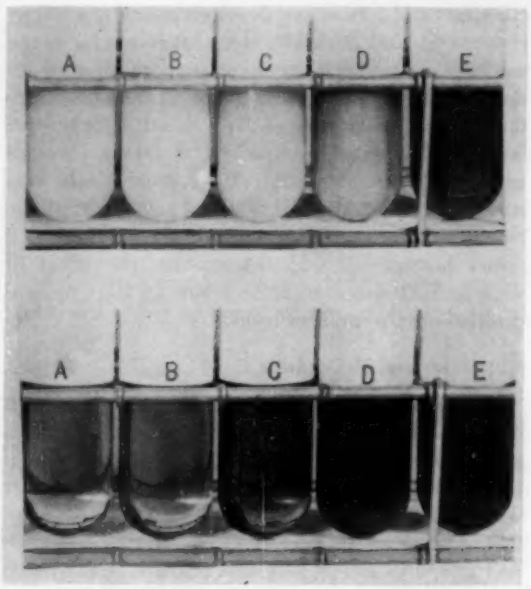


CHART 2. INFLUENCE ON PEROXIDE NUMBER OF FRYING POTATOES OR FRITTER BATTER

The fat darkened in color quite rapidly when batter was fried, the predominant color change appearing to be toward the browns. In contrast, the color change of the fat in which potatoes were fried was slow and was chiefly a development of yellows. These observations on color were a result of detailed study which will be reported elsewhere. When samples of lard used for frying fritter batter were solidified (upper row of the photograph), the white crystalline character at first obscured the change in darkening. These same samples, melted, showed a gradual darkening (see the photograph, lower tier).

The curves of chart 3 indicate that, with continuous process lard, a batter containing only flour, sugar, and water did not show the increase in free fatty acid noted in the control and in the no-sugar batter. The smoke point remained at a high level during frying when the batter of only flour, sugar, and water was used but showed a considerable decrease for the other two batters fried. The peroxide numbers, shown in chart 4, showed a somewhat higher level with the no-sugar batter than with the control but did not equal that of the flour, sugar, and water mixture. Iodine and saponification numbers showed only slight changes in all cases and are not presented. It is evident that the lack of milk, eggs, and baking powder in the sugar-flour batter reduced the amount of change, during frying, of the smoke points and free fatty acids occurring in both the



Color of continuous process lard used for frying fritter batter. Upper row: samples at room temperature. Lower row: same samples at 60°C (A) before frying, (B) 2 batches, (C) 5 batches, (D) 10 batches, (E) 20 batches of batter fried

control and no-sugar batters but produced even higher peroxide values.

In charts 5 and 6 are shown the effects of baking powder variation in fritters fried in a retail market sample of lard. The type of baking powder used, single acting in the control or double acting as indicated, had some effect on free fatty acid but little on the peroxide number and smoke points.

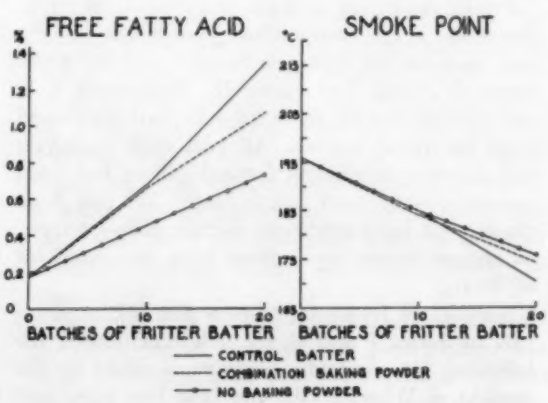


CHART 3. EFFECT OF BATTER INGREDIENTS ON PERCENTAGE OF FREE FATTY ACID AND ON THE SMOKE POINT OF THE LARD

When all ingredients except baking powder were present, the free fatty acid increased less and the peroxide values increased more than in the control (tartrate baking powder) batter. Even though two types of lard were used, there were greater differences from the control in peroxide values and smoke points when milk, eggs, and baking powder were omitted in the sugar-flour batter than when baking powder alone was lacking. Therefore, milk and egg, as well as baking powder, would appear to be responsible for the resulting changes. Since egg and baking powder, particularly, increase the porous qualities of batter, this suggested that porosity may have been a factor of importance in producing the trend of changes described.

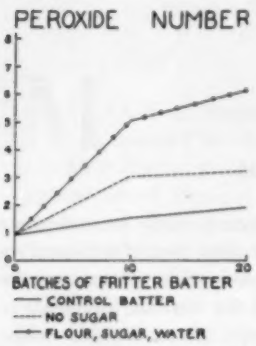


CHART 4. CHANGE IN PEROXIDE NUMBER CAUSED BY MODIFICATION OF BATTER INGREDIENTS

Fat absorption for the batter containing no baking powder was about half that of the control. However, still less fat was absorbed by the flour, sugar, and water batter. There seemed to be little significant difference in absorption as a result of the type of baking powder used. These conclusions are apparent from the following data on fat absorption:

BATTER MODIFICATION	AVERAGE FAT ABSORPTION IN GRAMS PER BATCH OF BATTER
Continuous process lard	
Control batter	49
No sugar batter	31
Flour, sugar, and water batter	8
Retail market lard	
Control batter	56
Combination baking powder batter	61
No baking powder batter	30

The balls containing no leavening agent were smaller and much less porous, and this combination of factors may have been chiefly responsible for the wide differences.

The use of peroxide numbers alone as a test for quality of frying fat would not appear feasible. Great variation has been noted, and a very low peroxide number was often associated with a dark fat, displeasing in appearance. No peroxide values could be demonstrated on the absorbed fat extracted from fritter ball crusts. In general, peroxide numbers reported in this study were lower than those recorded by Lowe *et al.* (7) and also by

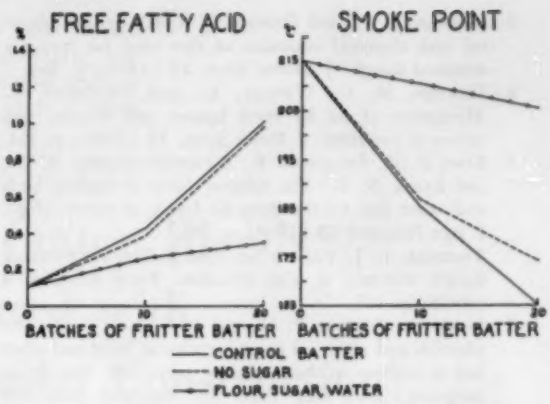


CHART 5. INFLUENCE OF BAKING POWDER ON PERCENTAGE OF FREE FATTY ACID AND ON THE SMOKE POINT OF LARD

King *et al.* (5). The fact that lard containing antioxidants was used in this study may be a partial explanation of these differences.

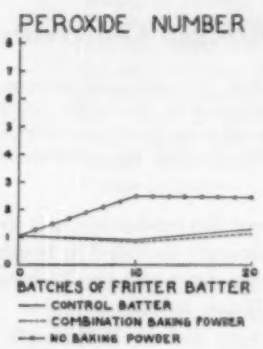


CHART 6. CHANGE IN PEROXIDE NUMBER AS AFFECTED BY BAKING POWDER

Summary and Conclusions

The frying of fritter batter caused a greater degree of decomposition than did potatoes as shown by a more pronounced increase in free fatty acid and decrease in smoke point. Peroxide values remained at lower levels with the frying of batter. Iodine and saponification numbers were little affected in either case.

The color of the fat darkened markedly with batter frying, and the gross appearance of the fat was undesirable. This condition might easily lead to early disposal of the fat by the average homemaker.

Baking powder, milk, and eggs appeared to be the ingredients in batter exerting great influence on the decomposition of lard. Fat absorption was reduced in the absence of a leavening agent.

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Michigan Conference on Home Management

[The following comments about the conference on home management conducted at Michigan State University, July 4 to 6, 1955, under the direction of Irma Gross were written by one of the 85 persons who attended the conference.]

The important thing about this conference was its perception of the broad concepts included in home management or, as the theme suggested, the "Values and Decision Making in Home Management."

In the keynote address on values, William W. McKee of the Merrill-Palmer School faculty in Detroit commented that, though they were once the domain of professional philosophers, questions about values are now raised by men and women in all walks of life. Values in home management, such as planning, skills, order, and efficiency, must be related to the central goal of enabling all family members to grow into mature and healthy persons —physically, emotionally, intellectually, socially, and spiritually. Dr. McKee asked how much of our planning in home management goes deep enough to foresee what will be the impact of the plans on human lives.

Main talks of the second conference day were on decision making by Professor C. A. Bratton of Cornell University and his wife, Esther Crew Bratton, and "Cooperative Research Project on Decision Making in Farm Management" by Professor Glenn L. Johnson of Michigan State University. Professor Johnson, in analyzing decisions, divided them into *learning situations* in which decisions are postponed in favor of seeking more information; *risk action situations* in which a decision is made because more information would be too costly; *forced action situations* in which outside forces make action mandatory in spite of the need for further information; *inaction situations* in which information is inadequate and the problem not important; lastly, managers may be in a *certainty situation* when a manager regards his information as so perfect that he will act without taking precautions. Conference work groups, discussing the problem of *joint* decision making, pointed out that conflicts may lead to dominance, compromise, or to the creative level of a new synthesized concept, integration.

Margaret Liston of Iowa State College, in summing up the conference, expressed the hope that those present would launch themselves professionally into what may be one of the most challenging eras of home management and home economics.

Clearly, a great deal of "on-the-job" training will be needed; but home economists are not alone in that respect. Indeed, revaluation and new learning are the rule for almost all vocations in our dynamic age. The shift in emphasis from the tangible to the intangible is the same for home management as for management in business and industry. Modern families are adapting the learning from these fields to their family councils and husband-wife teamwork, thereby achieving creative forms of joint decision making.

The Michigan Conference was a far-seeing effort which will spur us on in this direction.—Mathilde C. Hader, *Arlington, Virginia.*

Everyone who chooses clothing for the family or cares for the family's clothes, as well as those in retailing, manufacturing, and the teaching of clothing selection and care, will find this study of one of the most popular new fiber blends in men's shirts of much practical interest.

Qualities of Dacron and Cotton Blends Used in Shirtings Compared with All-Cotton Fabrics of Similar Construction[1]

Janet B. Hawkins and Pauline E. Keeney

Dr. Keeney is a professor of textiles at the Woman's College of the University of North Carolina where Miss Hawkins was a graduate assistant when this research was undertaken. At the present time Miss Hawkins is an instructor in home economics at the University of Connecticut. Much of the data included in this report is taken from Miss Hawkins' thesis presented in partial fulfillment of the requirements for the Master of Science degree at the Woman's College.

MUCH of today's fabric manufacturing is marked by the blending of natural and synthetic fibers. Research is directed toward the production of blended yarns and fabrics that will display to the utmost advantage the favorable characteristics of each of the constituent fibers and minimize their detrimental characteristics.

The 65 per cent Dacron and 35 per cent cotton blended fabrics used for shirts, blouses, and lingerie are some of the more recent products presented to the public. It is claimed that they combine the comfort and attractive appearance of cotton with the long-wearing strength and easy maintenance qualities of Dacron.

Shirts made of Dacron and cotton are comparatively recent additions to the shirting industry. They are in the higher price bracket, and relatively few people have had an opportunity to judge their value other than through advertising which emphasizes desirable features. Advertising claims indicate improvement over cotton shirtings by stressing the non-wrinkling features of the fabrics and the little attention needed in laundering. It is claimed that the fabric does not wrinkle; collars will not wrinkle after becoming damp; garments may be washed and hung to dry and will require little or no ironing. Less emphasis is placed upon the wearing qualities of the fabrics.

This study, a part of a larger research project in progress at the Woman's College, compares the qualities of the 65 per cent Dacron and 35 per cent cotton blends used in shirtings with all-cotton fabrics of similar construction. Two types of fabric, Oxford and batiste, were selected to determine the relative merits of Dacron and cotton blended fabrics. Any variations in performance attributable to the use of Dacron in the blend were sought through controlled laboratory testing. The tests included an analysis of fabric construction; measurement of dimensional changes; evaluation of appearance, fabric strength, and crease-resistance after multiple laundering.

Four Oxford-type and four batiste-type Dacron and cotton blended fabrics were obtained from wholesale houses, fabric manufacturers, and shirt manufacturers.

The all-cotton fabrics selected for comparison of serviceability features were purchased from retail stores. Because of variations likely to be noted in fabric construction, three qualities of each type of the all-cotton shirtings were selected. One quality was selected with construction features similar to the average of the construction characteristics of the Dacron and cotton blend. One quality was above the average, and one was below the average.

[1] Contribution from the School of Home Economics of the Woman's College of the University of North Carolina published with the approval of the North Carolina Agricultural Experiment Station as Paper No. 658 of the Journal Series.

Testing Procedures

With the exception of the laundering procedure and the rating of the fabric appearance, all tests used to determine fabric construction and serviceability features were standardized procedures or procedures recommended by the manufacturer of the testing device.

The laundering procedure formulated for this particular study was adapted from washing instructions accompanying men's shirts of Dacron and cotton and from procedures for home laundering of fabrics of this type recommended by the manufacturer of the synthetic fiber and authorities on home laundering.

A semi-automatic control commercial washer with the control set for mild agitation was used with the following washing procedure: a concentration of 0.15 per cent mild neutral soap was used with an 8-pound load of all-white laundry. The load was rinsed in cold water for one minute, then washed for 5 minutes at 120° Fahrenheit. This was followed by 3 two-minute rinses at 100° Fahrenheit.

The test swatches were then hung to drip dry. When the appearance after laundering had been rated, the swatches were rolled between damp towels and allowed to remain there for 1 hour to assure a more consistent amount of moisture. They were then pressed on a flat bed press for 3 seconds at low temperature.

This laundering procedure was repeated 20 times, removing swatches for serviceability tests after 1, 2, 5, 10, and 20 launderings.

The appearance of all fabrics as influenced by the resistance to wrinkling during laundering was rated after the fabrics had dried. They were rated at each testing period according to the following criteria:

Class 1—No ironing necessary (surface of fabric free from wrinkles; suitable for use in present state)

Class 2—Small amount of ironing necessary (superficial wrinkles; wrinkles easily removed)

Class 3—Considerable ironing necessary (multiple wrinkles deeply set; requiring heat, moisture, and pressure for optimum appearance)

Results

Fabric construction. The laboratory analysis of the construction of the fabrics used in the study is shown in table 1. According to the laboratory analysis of fiber content, the majority of the blended fabrics had slightly more than the specified 65 per cent Dacron and slightly less than 35 per cent cotton.

TABLE 1

Laboratory analysis of fabric construction

FABRIC NUMBER	FIBER CONTENT		WEAVE	WIDTH	THICKNESS	WEIGHT	THREAD COUNT		YARN NUMBER		STAPLE LENGTH		TWIST COUNT	
	Dacron	Cotton					Warp	Filling	Warp	Filling	Warp	Filling	Warp	Filling
	per cent	*per cent*		*inches*	*inches*	oz/sq yd					*inches*	*inches*		
GROUP I—Oxford-Type Dacron and Cotton Blended Fabrics														
1	68.4	31.6	2 x 2 Basket	38	0.016	3.5	100	93	40.4	40.7	1.7	1.5	29 Z	31 Z
2	68.7	31.3	2 x 2 Basket	38	0.016	3.4	100	90	41.4	40.4	1.7	1.5	29 Z	34 Z
3	62.7	37.3	2 x 1 Basket	42	0.026	4.8	76	46	25.4	14.8	1.6	1.5	21 Z, ply 17 S	14 Z
4	68.9	31.3	2 x 1 Basket	45	0.021	4.4	94	46	39.9	12.1	1.5	1.7	26 Z	14 Z
Average	67.2	32.8		40.7	0.020	4.0	93	69	36.8	27.0	1.6	1.5	26.2	24
GROUP II—Oxford-Type All-Cotton Fabrics														
1	.....	100.0	2 x 1 Basket	36	0.019	4.1	100	50	54.8	13.2	1.3	1.3	26 Z	10 Z
2	.....	100.0	2 x 1 Basket	35	0.025	3.9	98	44	44.8	13.6	1.3	1.3	22 Z	11 Z
3	.....	100.0	2 x 1 Basket	38	0.023	4.0	94	45	42.2	13.5	1.3	1.1	20 Z	11 Z
Average		100.0		36.3	0.022	4.0	97	46	45.6	13.4	1.3	1.2	23	11
GROUP III—Batiste-Type Dacron and Cotton Blended Fabrics														
1	68.2	31.8	Plain	38	0.014	2.7	101	86	48.8	53.0	1.6	1.5	34 Z	37 Z
2	69.4	30.6	Plain	38	0.016	2.5	101	89	50.2	61.8	1.5	1.5	30 Z	37 Z
3	66.5	33.5	Plain	45	0.016	2.6	102	76	49.6	49.0	1.5	1.6	25 Z	27 Z
4	64.5	35.5	Plain	44	0.019	3.1	96	80	41.5	45.3	1.5	1.5	22 Z	21 Z
Average	67.2	32.8		41	0.016	2.7	100	83	47.5	52.0	1.5	1.4	28	30
GROUP IV—Batiste-Type All-Cotton Fabrics														
1	.....	100.0	Plain	38	0.009	1.4	114	108	93.8	135.8	1.6	1.5	32 Z	32 Z
2	.....	100.0	Plain	40	0.011	1.9	96	98	62.6	80.8	1.2	1.3	26 Z	32 Z
3	.....	100.0	Plain	39	0.013	1.8	90	78	67.6	67.4	1.3	1.3	26 Z	26 Z
Average	.....	100.0		39	0.011	1.7	100	95	74.7	94.7	1.4	1.4	26	30

The similarity of construction of the Dacron and cotton fabrics and the all-cotton fabrics of Oxford type was shown in the thickness, weight per square yard, and warp thread count.

The greatest construction differences between the Dacron and cotton blends and the all-cotton fabrics of Oxford type were noted in the weave of the fabrics. Two of the Dacron and cotton fabrics were of a 2 x 1 basket weave construction, and 2 were of a 2 x 2 basket weave. The three all-cotton fabrics were of a 2 x 1 basket weave construction. As a result of the difference in weave, the average filling thread count of the Dacron and cotton fabrics was 69 yarns per inch as compared with an average of 46 yarns per inch in the all-cotton fabrics.

The fineness of the yarns as indicated by the yarn number was also an outstanding difference in the two groups of fabrics. The warp yarns of the all-cotton fabrics were finer than were those of the Dacron and cotton. The filling yarns of the 2 x 2 basket weave blended fabrics were much finer than were the filling yarns of the all-cotton fabrics.

Other construction differences of the Oxford-type fabrics were noted in staple length and twist count.

The Dacron and cotton blends of the bastiste-type were similar to the all-cotton fabrics in many construction features. All fabrics in each group were of a fine plain weave and were of similar staple length, twist count, and warp thread count. The differences in thickness, weight per square yard, yarn number, and filling thread count indicated finer quality in the all-cotton fabrics.

Fabric appearance. The blended fabrics were quite pleasing in appearance and in texture. There was no visible indication of the use of a synthetic fiber in the fabric construction nor was there any indication of qualities that would indicate unusual wrinkle resisting properties.

The evaluation of the appearance after laundering was based upon the apparent resistance to wrinkling. The Dacron and cotton blended fabrics were much more satisfactory in this respect than were the all-cotton fabrics. Throughout the 20 launderings the majority of both types of Dacron and cotton fabrics needed nothing more than a small amount of ironing to restore them to their original appearance. The all-cotton fabrics required moisture, heat, and pressure for the removal of wrinkles after each laundering period.

One precaution that must be observed in maintaining the wrinkle-free appearance of the Dacron and cotton blended fabrics is to hang garments of

TABLE 2

Percentage dimensional change after laundering

FABRIC NUMBER	NUMBER OF TIMES LAUNDERED									
	1		2		5		10		20	
	Warp	Filling	Warp	Filling	Warp	Filling	Warp	Filling	Warp	Filling
	per cent	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*
GROUP I—Oxford-Type Dacron and Cotton Blended Fabrics										
1	+0.4	−0.2	+0.7	−0.2	+0.9	−0.7	+0.7	−0.7	+1.1	−1.1
2	+0.4	−0.2	+0.5	−0.3	+0.4	−0.6	+0.3	−1.0	+0.2	−0.4
3	−0.6	+0.4	−0.8	+0.7	−0.9	+1.1	−1.3	+1.5	−1.0	+0.6
4	+0.4	+0.6	+0.1	+0.8	+0.4	+1.1	−0.1	+1.4	−0.3	+1.1
Average	+0.2	+0.2	+0.1	+0.3	+0.2	+0.2	−0.1	+0.3	0.0	+0.1
GROUP II—Oxford-Type All-Cotton Fabrics										
1	+0.3	−0.4	+0.3	−0.7	+0.1	−0.5	−0.3	−0.6	−0.5	−0.2
2	+0.2	+0.7	−0.1	+0.9	−0.5	−0.1	−0.2	+0.2	−0.6	+0.1
3	+0.6	0.0	−0.2	−0.2	−1.2	−0.1	−1.3	+1.0	−1.1	+0.2
Average	+0.4	+0.1	0.0	0.0	−0.5	−0.2	−0.3	+0.2	−0.7	0.0
GROUP III—Batiste-Type Dacron and Cotton Blended Fabrics										
1	+0.1	+0.2	+0.2	0.0	0.0	+0.2	−0.4	0.0	−0.5	−0.2
2	+0.1	−0.2	+0.2	−0.2	−0.1	0.0	−0.2	+0.3	−0.5	−0.3
3	−0.7	−0.1	−0.9	−0.2	−0.8	+0.1	−1.0	−0.1	−0.9	−0.2
4	+0.4	+0.1	+0.5	+0.6	+0.2	+0.9	+0.2	+0.7	+0.2	+0.6
Average	0.0	0.0	0.0	+0.1	−0.2	+0.3	−0.4	+0.2	−0.4	0.0
GROUP IV—Batiste-Type All-Cotton Fabrics										
1	−2.2	−3.5	−1.9	−4.1	−2.4	−4.1	−1.9	−4.0	−2.3	−4.2
2	−2.2	−6.5	−2.5	−7.1	−2.5	−7.6	−3.1	−7.8	−3.0	−7.4
3	−2.1	−6.0	−2.4	−6.5	−2.9	−7.4	−3.0	−6.2	−3.4	−6.4
Average	−2.2	−5.3	−2.3	−5.9	−2.6	−6.4	−2.7	−6.0	−2.9	−6.0

these fabrics to drip dry immediately following removal from the water. These blends of natural and hydrophobic fibers dry very rapidly. Any wrinkles that are allowed to form and dry in the fabric are difficult to remove.

Dimensional change. The percentage of dimensional change after laundering of the fabrics is shown in table 2.

There was little difference in dimensional stability between the Dacron and cotton blends and the all-cotton fabrics of Oxford type. The average change in both warp and filling dimensions was within a shrinkage or stretch of 1 per cent at each testing period. Several of the individual fabrics in each group exceeded the 1 per cent at various testing periods but none of them exceeded 2 per cent. Garments of fabrics showing so little tendency for change in dimensions would be satisfactory in use.

The Dacron and cotton batiste-type fabrics were much more stable dimensionally than were the similar all-cotton fabrics. The Dacron and cotton fabrics did not shrink or stretch more than 1 per cent throughout the 20 launderings. The all-cotton fabrics shrank more than 2 per cent after the first laundering and increased progressively at each subsequent laundering period. The excessive amounts of shrinkage noted in these fabrics indicate the lack of a preliminary treatment to guarantee a dimensional stability that would be satisfactory in consumer use.

Tensile strength. The tests used to compare fabric strength indicated differences between the blends and all-cotton fabrics of both Oxford and batiste types.

The all-cotton fabrics of the Oxford type were stronger than were the Dacron and cotton blends in both dry and wet strength. The dry and wet warp strength was higher by approximately 7 pounds while the dry and wet filling strength of the all-cotton fabrics exceeded that of the Dacron and cotton fabrics by at least 40 pounds. This same trend in strength difference was apparent in the laundered fabrics at each testing period.

In the batiste-type fabrics, the blended fabrics were slightly stronger than were the all-cotton fabrics. The differences in dry and wet strength of the unlaundered fabrics did not exceed eight pounds in either warp or filling. This same trend in strength difference was apparent in the laundered fabrics.

The breaking strength tests also indicated losses in strength of both Oxford- and batiste-type fabrics as laundering progressed (tables 3 and 4).

TABLE 3

Percentage change in dry breaking strength after laundering

FABRIC NUMBER	NUMBER OF TIMES LAUNDERED									
	1		2		5		10		20	
	Warp	Filling	Warp	Filling	Warp	Filling	Warp	Filling	Warp	Filling
	per cent	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*
GROUP I—Oxford-Type Dacron and Cotton Blended Fabrics										
1	+0.3	+2.2	−1.0	−5.8	−6.1	−6.2	−8.9	−9.1	−9.9	−11.2
2	+4.1	+9.6	+0.8	−0.8	−6.1	−2.8	−7.1	−12.7	−8.6	−6.4
3	+0.7	−10.4	−1.1	+3.3	−2.7	−4.9	−6.7	−16.1	−11.9	−18.3
4	−2.2	−1.2	+2.2	−0.5	−3.8	−6.4	−7.3	−7.5	−10.8	−14.4
Average	+0.7	−1.7	0.0	−0.3	−4.7	−5.3	−7.5	−11.6	−10.9	−13.5
GROUP II—Oxford-Type All-Cotton Fabrics										
1	+2.7	+1.4	+4.2	−3.7	−1.3	−6.8	−3.3	−5.9	−7.1	−15.9
2	+7.1	+6.6	+1.2	−3.7	−6.0	−4.6	−10.5	−5.0	−15.5	−3.7
3	+1.7	−0.5	+7.6	+1.1	+5.2	−4.1	−4.4	−7.9	−3.5	−8.8
Average	+3.8	+2.6	+4.2	−2.6	−0.9	−5.3	−4.9	−6.3	−8.9	−10.0
GROUP III—Batiste-Type Dacron and Cotton Blended Fabrics										
1	−2.4	+32.6	−4.1	−4.4	−6.5	−12.3	−11.2	−14.5	−11.5	−11.9
2	−9.2	−8.4	−4.5	−2.2	−10.7	−6.2	−14.3	−17.4	−19.3	−11.0
3	+1.2	+8.0	−0.6	−4.0	−6.6	−7.1	−1.8	−20.6	−10.5	−18.6
4	+7.2	+12.7	−1.7	+13.4	−5.5	+2.0	−18.0	0.0	−12.7	+7.2
Average	−2.2	+11.4	−2.5	+2.0	−7.0	−5.3	−11.4	−11.7	−13.5	−6.9
GROUP IV—Batiste-Type All-Cotton Fabrics										
1	−0.6	−1.2	−15.3	−2.9	−5.8	−2.9	−11.3	−7.6	−18.0	−5.8
2	+11.1	+6.0	+5.2	+4.6	+4.6	−8.8	+3.3	−28.2	−5.6	−8.8
3	+19.9	+12.7	+19.5	+4.2	+9.1	−5.3	+2.6	+5.8	−3.0	−1.6
Average	+9.0	+6.3	+1.4	+2.6	+1.8	−5.8	−2.5	−10.9	−9.7	−5.3

TABLE 4

Percentage change in wet breaking strength after laundering

FABRIC NUMBER	NUMBER OF TIMES LAUNDERED									
	1		2		5		10		20	
	Warp	Filling	Warp	Filling	Warp	Filling	Warp	Filling	Warp	Filling
	per cent	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*
GROUP I—Oxford-Type Dacron and Cotton Blended Fabrics										
1	−1.4	+6.3	+1.5	+7.5	−2.3	−6.7	−4.7	+7.5	−6.8	+6.3
2	+7.3	+3.4	+4.0	−2.3	+2.4	−14.4	−3.5	−11.7	−2.1	−8.4
3	+0.6	−10.8	−0.4	+11.0	−3.8	+6.3	−4.1	−7.6	−4.3	−6.9
4	+5.2	−5.6	−0.3	+2.2	−0.5	−11.6	−0.8	−9.2	−2.6	−10.5
Average	+2.8	−3.6	+1.4	+5.0	−1.2	−5.6	−3.3	−6.2	−3.9	−5.9
GROUP II—Oxford-Type All-Cotton Fabrics										
1	−4.7	−0.4	−2.0	−7.4	−10.4	−7.3	−14.0	−13.8	−12.4	−9.4
2	−2.3	+2.6	−3.1	+17.2	−11.9	+11.6	−14.8	−2.2	−6.8	+9.0
3	+4.6	−0.4	−2.6	−0.4	−14.9	−2.7	−15.9	−9.8	−15.2	−1.8
Average	−0.8	+0.4	−2.6	+1.4	−12.4	−0.9	−14.9	−9.5	−11.3	−2.3
GROUP III—Batiste-Type Dacron and Cotton Blended Fabrics										
1	−2.5	+2.1	−4.9	+1.2	−6.4	−5.7	−10.0	−7.7	−9.0	−4.5
2	−5.7	−4.5	−5.5	+11.8	−10.4	−6.1	−11.7	−10.6	−17.2	−6.5
3	+1.5	−3.4	+2.0	−2.6	−0.9	−9.4	−2.3	−12.0	−5.0	−5.6
4	−1.7	+8.6	−3.3	+13.6	−6.0	+2.2	−7.9	+1.1	−9.5	+8.6
Average	−2.0	+1.8	−3.0	+7.0	−6.0	−3.8	−8.0	−6.3	−10.0	−0.7
GROUP IV—Batiste-Type All-Cotton Fabrics										
1	−17.1	+2.1	−4.1	−15.2	−7.6	−18.0	+0.6	−13.0	−5.6	−19.0
2	−7.8	−4.2	+2.4	−22.0	−14.6	−22.9	−6.8	−17.4	−12.7	−19.1
3	+7.5	+17.2	+5.2	−14.1	−7.1	+1.0	−8.2	−2.1	−6.7	−7.8
Average	−7.1	+4.4	+0.9	−17.6	−10.0	−13.7	−4.6	−11.2	−8.6	−10.7

TABLE 5

Percentage crease recovery before and after laundering

FABRIC NUMBER	NUMBER OF TIMES LAUNDERED											
	Original		1		2		5		10		20	
	Warp	Filling	Warp	Filling	Warp	Filling	Warp	Filling	Warp	Filling	Warp	Filling
	per cent	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*
GROUP I—Oxford-Type Dacron and Cotton Blended Fabrics												
1	83.0	79.2	72.0	70.1	73.1	80.2	74.8	77.0	75.8	81.6	79.3	81.3
2	78.7	83.9	74.7	73.3	73.9	80.4	75.6	78.6	76.4	80.4	78.9	79.3
3	80.4	75.1	79.4	74.7	80.4	68.6	80.4	71.6	81.3	74.3	82.8	75.0
4	69.1	73.4	74.6	74.0	75.6	75.7	73.3	74.4	76.1	78.8	78.4	75.3
Average	77.8	77.9	75.2	73.0	75.8	76.2	76.0	75.4	77.4	78.8	79.9	77.7
GROUP II—Oxford-Type All-Cotton Fabrics												
1	46.2	40.9	44.8	40.0	46.9	42.3	47.8	42.3	45.7	43.3	50.1	47.2
2	50.2	45.0	46.4	38.0	43.4	45.0	47.4	45.6	43.0	42.6	45.2	44.9
3	44.3	43.7	45.9	45.2	48.8	45.7	44.1	42.7	45.8	43.6	48.3	47.3
Average	46.9	43.2	45.7	41.1	46.4	44.3	46.4	43.5	44.8	43.2	47.9	46.5
GROUP III—Batiste-Type Dacron and Cotton Blended Fabrics												
1	71.4	75.4	71.7	72.3	70.7	73.4	70.9	73.7	75.8	74.3	75.1	74.4
2	68.2	74.9	77.3	69.3	75.3	73.9	73.3	75.4	74.6	76.3	73.2	79.0
3	81.3	79.9	79.1	77.0	77.2	80.3	77.3	77.6	78.2	79.1	77.6	80.9
4	71.4	73.8	66.1	69.3	69.6	71.6	72.2	75.4	69.8	74.9	71.3	74.7
Average	73.1	76.0	73.6	72.0	73.2	74.8	73.4	75.5	74.6	76.2	74.3	77.3
GROUP IV—Batiste-Type All-Cotton Fabrics												
1	38.3	41.9	36.6	44.6	37.3	47.6	37.4	51.3	41.6	52.6	41.0	49.8
2	40.4	39.3	38.4	43.7	31.9	44.6	41.7	43.3	43.2	46.6	45.2	45.2
3	35.3	41.6	35.6	44.4	42.0	44.0	41.7	45.4	46.7	47.3	47.6	44.2
Average	38.0	40.9	36.9	44.2	37.1	45.4	40.3	46.6	43.8	48.8	44.6	46.4

The percentage changes in the Dacron and cotton fabric of Oxford type were quite similar to those of the all-cotton fabrics. There was less consistency in the strength changes of the batiste-type fabrics at the various testing periods, but a general trend toward loss in strength was apparent.

Both Oxford- and batiste-type fabrics of Dacron and cotton and the all-cotton construction were within a 15 per cent strength loss. This was true of both dry and wet warp and filling strength.

Crease recovery. The ability of the fabrics to resist wrinkling is expressed in terms of the percentage crease recovery. This is determined by dividing the crease-recovery angle by 180° and multiplying by 100. A crease-recovery angle of 125 degrees is considered necessary if a fabric is to exhibit acceptable performance. This degree angle interpreted in percentage crease recovery is equal to 69.4 per cent recovery, which is used as the standard in this study (table 5).

The Dacron and cotton fabrics were superior to the all-cotton fabrics in crease or wrinkle recovery. The Dacron and cotton fabrics consistently exceeded the 69.4 per cent standard set for fabrics to exhibit acceptable performance. None of the all-cotton fabrics approached this standard. The Dacron and cotton fabrics also exhibited a much more rapid immediate recovery than did the all-cotton fabrics. All Dacron and cotton and all-cotton fabrics showed an increased resistance to creasing after the 20th laundering. This was influenced by the effect of shrinkage and repeated pressing upon the fabric rather than by any changes in fiber properties.

Summary

Certain advantages offered by the blending of Dacron and cotton fabrics were indicated in this study. Those most apparent were (1) the maintenance of the original appearance and texture after repeated laundering; (2) the resistance to creasing or wrinkling and the ability to recover readily; and (3) the ease of laundering and finishing such fabrics.

Each of these advantages, however, is dependent upon the care given during laundering. The wrinkle-free appearance is lost if the fabrics are not hung to drip dry. Wrinkles set in the fabrics by wringing and spin drying are as difficult to remove as are those in all-cotton fabrics.

Claims of superior dimensional stability and fabric strength were not substantiated. There was little difference between the dimensional stability of the Dacron and cotton blends and the all-cotton fabrics that had been pre-shrunk. There was also little difference indicated in fabric strength with the exception of the filling strength of the all-cotton Oxford-type fabrics. This was far superior to that of the Dacron and cotton fabrics of similar type.

While laboratory tests are valuable in indicating fabric strengths and weaknesses, it is not possible to make positive conclusions in regard to their performance in consumer use. The serviceability of garments made of the fabrics would be influenced by many factors that require subjective testing to determine those most important to the consumer in his choice of shirts.

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Social Welfare and Public Health Section Attention

Are you interested in a preconvention workshop in New York City June 21 to 22 on your way to the AHEA meeting in Washington?

Some "yeses" are already in; we need the others soon if we are to go ahead with workshop plans. For the program we need to know:

Do you want to discuss budget standards, or in-service training, or welfare of the aged, or rehabilitation, or your problems in general?

April 1 is our deadline for workshop plans. Write to G. Dorothy Williams, New York City Department of Health, 125 Worth Street, New York 13, N. Y.

The precise sampling technique used to obtain the subjects for this study indicates that the findings can probably be applied to a broad population. The findings will have usefulness for teachers, extension workers, and for students doing research and will contribute to our knowledge of child development and family relationships.

Parents' Acceptance of Their Children[1]

Glenn R. Hawkes, Lee G. Burchinal, Bruce Gardner, and Blaine M. Porter

Dr. Hawkes is professor and head of the department of child development, Mr. Burchinal is a research associate in home economics research, and Dr. Gardner is an assistant professor of child development and home economics research at Iowa State College. Dr. Porter is chairman of the department of human development and family relations at Brigham Young University in Utah.

IN July of 1949 approval was granted for a research project, "Relation between selected variables of farm family living and personality patterns of children" by the Iowa State College Agricultural Experiment Station. This research was designed to measure personality development of rural children. As the study was developed the complexity of the over-all problem of personality development in the family became more apparent. The lack of any organized theoretical frame of reference, and the corresponding dearth of appropriate measuring instruments, made it extremely difficult to move ahead rapidly with attempts to test specific hypotheses about personality growth. Initial efforts were, therefore, focused largely on the development of a theoretical frame of reference out of which crucial variables related to personality growth might be selected, defined, and measured to determine their relative significance.

Early in 1950 the project took on broader significance as a North Central Region Technical Committee on Farm Family Living was organized, and a master research project on this subject was organized in the land-grant colleges of the 12 states comprising the North Central Region. The major objectives of this master project were (1) to study the factors within the family which influence personal and social development of children, (2) to utilize existing methods of research and develop new techniques, (3) to add to knowledge of personality development and related child-rearing practices, and (4) to stimulate co-operative research in the North Central Region.

Each state in the region was represented on a central technical committee, and it was decided that each participating state should organize a subproject, or smaller segment of the total master project. It was further agreed that each state would develop its subproject by drawing on the strengths and resources of its several academic and professional areas, placing emphasis on an interdisciplinary approach. At Iowa State College, a committee was subsequently organized, representing the fields of psychology, sociology, child development, statistics, and home economics. This committee was charged with responsibility for developing research on the relationship between selected variables of family living and personal and social behavior of children.

As a basis for the development of new measuring instruments a comprehensive theoretical frame of reference was developed which has previously been described by Hawkes (*1*). This approach resulted in the defining of three major phases of the over-all project: (1) family interaction variables, (2) family structure variables, and (3) family-community interaction. It was decided to focus attention on the first phase, and this area was further subdivided into four classes of family interaction variables: (1) affectional family relationships, (2) control of behavior, (3) accept-

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ance of individuality, and (4) family unity. It was assumed that each of these variables existed along a continuum, the extremes of which represented conditions probably not conducive to optimum personality development. It was proposed that for each of these continuous variables measurements be made to determine its optimum level for the fostering of desirable personal and social development of children. This article is a report of research in the third area listed above; parental acceptance of the individuality of their children.

Porter has recently demonstrated that parental acceptance of children is subject to measurement.[2] The scale developed by Porter was sensitive enough to distribute the scores for the parents he tested over a wide range. However, Porter recognized the limitations of his sample for making generalizations relative to parental acceptance of children (2, p. 181). His sample, like many used in social investigations, drew heavily from the middle and upper middle-class levels of occupation, income, and education. Before valid generalizations can be drawn relative to parental acceptance of children, the measurement of this characteristic for a well-controlled sample of fathers and mothers is necessary. This measurement has now been made. As one part of the North Central Region research project which is designed to measure family influences on the personality development of children, the parental acceptance scale was completed by a well-controlled sample of 512 rural and small town fathers and mothers. It is felt that safe generalizations concerning parental acceptance can be made from this sample.

Description of the Sample Plan

One of the most significant features of this study is its sample design. In contrast to many studies based on non-controlled samples, the sample used in this study closely approximated a random sample drawn independently from four midwestern states. Only a brief description of the sample design is offered here to indicate the confidence which can be placed in the conclusions and generalizations drawn from the analysis of the parents' acceptance scores.

The universe of interest for this study comprised all rural and small town families in four midwestern states that were complete families having two or more children with at least one of these children enrolled in the fifth grade during the 1954-55 school year. Rural areas and cities up to 10,000 in population were included as possible sample areas. States actually sampled were Iowa, Kansas, Wisconsin, and Ohio. Complete families were those in which both parents were living and living together. The fifth grade criterion was intended to cover children in the 9- 10- and 11-year-old group. The decision was made to select children at the fifth grade level as the sample population for three reasons. First, skill in reading has progressed far enough to free the child from the mechanics and enable him to concentrate on the subject matter. Secondly, it is rather commonly believed that this age child has matured sufficiently to have developed a facility in factual interpretation of causal relationships. And last, the pressures of conforming with the culture have not been too deeply inculcated in the children to smother spontaneous answers.

Among several possible sampling schemes which might have been used to draw samples of eligible families (ones which met the criteria for interest in this study), it seemed that a stratified probability sampling method was the most practical and adequate.[3] The ultimate sampling units were the carefully defined families. The simplest and least expensive method of locating these families appeared to lie in first selecting the 10- or 11-year-old children of the families because the children are regularly assembled in schools and access to them is quite simple. Therefore, instead of immediately drawing families, a sampling plan utilizing schools with fifth grades was developed. All the statistical procedures and mechanics of selection need not be described here. However, in each of the four states two strata of population, rural and small cities (those having a maximum of 10,000 population), were defined. Eight sampling places, divided proportionately between the rural and urban strata for each state on the basis of population in each strata, were drawn by a probability method. At each of the sample places all the children in the fifth grade were asked to complete a short information blank. This was used to determine the eligibility of each family for possible inclusion in the sample. From the list of eligible children at each school, a simple random selection of eight families and four alternate families were drawn. The number of families selected in each

[2] For the operational definition of parental acceptance, the construction of the scale, its reliability and validity, see Porter (2).

[3] General references for a stratified probability sampling procedure are Cochran (3) and Hansen *et al.* (4).

state was, therefore, 64, and the sample for the region (the four states) was 256. The size of the state sample was established on the basis of results of a pretest which indicated that an interviewer could test the children and interview eight families during a period of about five days.[4] The same individual interviewed the parents and tested the children in all four states. Although the results described below are based on rather small samples, the samples were drawn by a very carefully defined and controlled method. Great care was taken during the field work to accurately implement the sample design. Therefore, it is thought that a high degree of confidence can be placed in the conclusions of the analysis of the data drawn from the universe defined for this study. Furthermore, these findings may be safely generalized not only to the population of parents defined for interest in this study but probably also for a larger population of rural and small town parents possessing essentially similar characteristics, that is, married at least 10 or 11 years, and having children.

Characteristics of the Sample

Thirty per cent of the families were living on farms; 51 per cent had rural nonfarm residences; and 19 per cent lived in small cities. Only one per cent of the fathers were engaged in professional occupations. Business or semiprofessional occupations, skilled or small trades occupations, or clerical or unskilled occupations each included 18 per cent of the fathers; 27 per cent of the fathers were farmers; and another 18 per cent of the fathers were unskilled workmen. Over half of the fathers were over 40 years of age, while over half of the mothers were under this age. The mean age for the mothers was 38 years of age, while that of the fathers was 42 years of age. Thirty-six per cent of the fathers and 18 per cent of the mothers had less than a high school education; 13 per cent of the fathers and 22 per cent of the mothers had terminated their formal education at some point in high school; 30 per cent of the fathers and 33 per cent of the mothers were high school graduates; and 21 per cent of the fathers and 27 per cent of the mothers had some training beyond the high school level. The average length of marriage for the 256 couples was 16.6 years. Families having two, three, and four children comprised about three-fourths of the sample. The mean number of children per family was 3.9.

Reliability and Validity of the Scale

Porter (2, p. 180) reported a split half reliability correlation of 0.766. Upon application of the Spearman Brown formula this estimate was raised to 0.865. In this investigation, a split half reliability coefficient of 0.666 was found. Through the use of the Spearman Brown formula, the total test reliability was estimated at 0.800. A correlation this high would occur due to chance less than once in a hundred times. Porter's estimate of the validity of the acceptance scale was accepted for the purposes of this study.

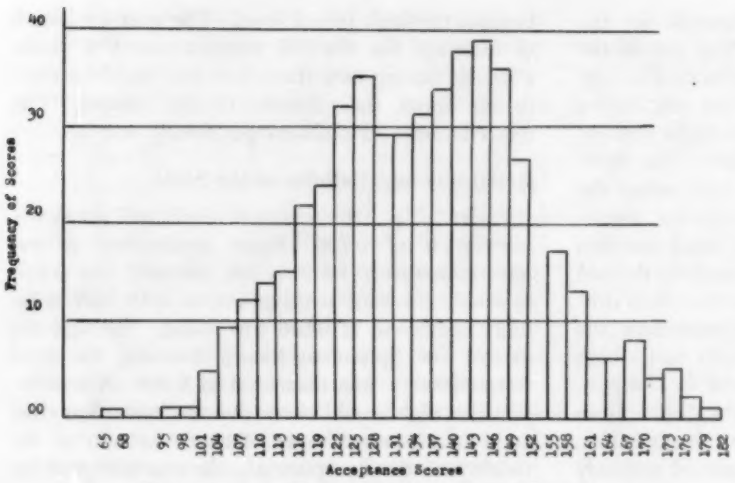
Findings

The possible range on the acceptance scale is from 40 to 200. Porter (2, p. 181) found a range from 87 to 187 for the 100 subjects he tested. In this study, the range for the scores of the fathers was from 68 to 179 while the range for the scores of the mothers was from 96 to 174.[5] The chart shows the frequency of scores grouped by three point intervals for fathers and mothers. Separate bars for fathers and mothers are not given because their frequency curves were very similar. It is evident that the two curves would closely resemble each other because of the similarity of the regional means and standard deviations of the fathers' and mothers' scores.

While a very clear central tendency existed for the combined distribution of parental acceptance scores, there was some slight tendency toward bimodality. The mode of the curve shown in the chart occurred in the 143 to 145 range of scores although the frequency of scores in the 125 to 127 and the lower adjacent interval suggested a second mode. The distribution as a whole, though, showed a definite central tendency apparently with little skewness. It might be noted that the mean of the distribution was 135.60, the median was 136.69, and the mode based on raw scores was 137. When the scores were grouped, the mode occurred at a higher score as noted above. The closeness of these

[4] The children completed two forms in school and the parents were asked to fill out a face sheet and four other tests in addition to the acceptance scale. Since the interviewer was present at school and at each of the homes to control the completion of the parents' forms, about five days were required to gather the data at any one point. Analysis of data gathered by means of the other tests is in progress and will be subsequently published.

[5] When the parents responded to the acceptance scale, they were instructed to select their responses on the basis of their feelings and behavior toward their fifth-grade child. Therefore, the acceptance scores reported in this article are, technically, a measure of the parents' acceptance of their ten-year-old child.



FREQUENCY OF PARENTAL ACCEPTANCE SCORES

statistics testify to the lack of any high degree of skewness of the scores. This suggests that the acceptance scale is not only capable of distributing scores over a wide range, but if a sufficient number of parents were tested, a distribution of scores approaching a normal distribution would probably result. With this picture of the distribution of the scores of the parents as a background, the mean scores of the fathers and mothers for each of the states and for the region are given in the table.

One of the hypotheses tested in this part of the regional project was: There are no significant differences among the acceptance means of the respondents from the four states. The observed differences among the state means were not very large; but, in order to be certain that these might have occurred only due to sampling variation, an analysis of variance was computed for the differences among the means. The F value for the state differences was equal to 0.91. Any F value less than unity indicates nonsignificance, and, therefore, the analysis of variance supports the hypothesis that no significant differences exist among the mean acceptance scores for respondents from the four states.

Mean parental acceptance scores of fathers and mothers by states and region

PARENTS	IOWA*	OHIO	KANSAS	WISCONSIN	REGION
Fathers....	132.48	132.08	132.16	134.56	132.82
Mothers....	136.67	139.38	137.02	140.42	138.37
Total.....	134.58	135.73	134.59	137.49	135.60

* The number of cases for each state was 128 (64 for each parent); the number for the region was 512 (256 for each parent).

Another hypothesis tested was: There is no significant difference between the mean acceptance scores of the fathers and mothers. It will be noted in the table that the mothers scored higher than the fathers in each of the four states. The regional mean score for the mothers was 138.37 with a standard deviation of 16.61; the regional mean score for the fathers was 132.82 with a standard deviation of 15.83. The means found for the present study correspond rather closely with the mean reported by Porter, 139.36 for his 100 respondents (2, p. 181). While the mothers scored 5.55 points higher on the average than the fathers, their scores showed a slightly greater degree of dispersion as indicated by the larger standard deviation. Again analysis of variance was used to test for the significance of the difference between the mean scores of the fathers and mothers. The F value was equal to 14.85 which, taken with the proper degrees of freedom, was significant beyond the one per cent level. The hypothesis that no significant differences existed between the acceptance scores of the fathers and mothers was found to be untenable. Instead, it was found that the mothers scored significantly higher than did the fathers. On the acceptance scale, higher score indicates a greater degree of acceptance of children.

The fact that the mothers' mean acceptance score was significantly, if only slightly, higher than the fathers' mean acceptance score might not be unreasonable to expect in light of the traditional cultural conditioning which women receive in our society concerning their attitudes toward marriage and child rearing. Traditionally, women more than men looked (and perhaps still do) to the marriage relationship and rearing of children as a much larger part of their life activities. These wives also have had to live more of their lives in a closer relation to their children than have their husbands, and perhaps in the process of their everyday interaction with their children they have come to understand and accept their children more than have their husbands.

The fathers and mothers were separately classified into three scoring categories, high, middle, and low according to the regional distribution of scores for each sex. Chi squares were calculated to test

for the significance of the difference in the frequency of persons in each of the scoring categories in relationship to certain items of descriptive data about the parents which were gathered at the time of the interview. The chi squares were computed separately for each sex and by each state for the independence of acceptance scores with the following characteristics: age, educational level, occupation of the father, number of years married, number of children in family of orientation or procreation, farm or nonfarm background, the sex of the child, and his ordinal position in the family. One other item, whether the mother worked or not, was included in the analysis for the mothers. After the chi squares were calculated for each state, the summating quality of the chi square was used to obtain an estimate for the region.

The number of fathers who had high, middle, or low scores was independent of each of the variables tested. None of the 45 chi squares for the fathers reached the 5 per cent level of significance. Only 6 of the 50 tests for the mothers produced significant results, although little importance was attached to these findings because different characteristics were involved in each case and none was found in more than one state. One characteristic for the mothers, length of marriage, occurred with a chi square which was significant not only for one of the state comparisons, but also at the regional level. Mothers who had been married for a longer period of time, more than 16 years, were found to be more accepting of children than were mothers married for a shorter period of time.

Some of the characteristics in relation to acceptance of children were also tested by Porter. He found that the educational level of the parent was the only item among those he tested which was significantly related to the degree to which parents accepted their children (5, p. 161). This was not found to be the case in this study. The difference in the results of these two investigations can probably be reconciled when the samples used in each of the studies are compared. Eighty-eight per cent of Porter's sample were high school graduates; 54 per cent had some college experience; 36 per cent had graduated from college; and 17 per cent had some post graduate work (5, p. 160). The educational attainment of the persons used in this sample is quite different and has been described earlier.

Porter's findings of parental acceptance in relation to education can be established for only a middle and upper socioeconomic group of parents. Many investigators, particularly in the family field, have drawn upon such populations of people for data. In this study, when an approximate random sample of rural and small town parents were tested, different conclusions in regard to the association of acceptance of children and educational level of the parents resulted. This discrepancy in the findings of two studies which were based on very different samples suggests that some of the commonly accepted "facts" of family research which are based upon samples drawn from middle and upper socioeconomic classes of urban respondents cannot be safely generalized to other segments of our population. Of course, the only adequate test of the association of parental acceptance scores with various characteristics of the respondents properly should be based on a sample stratified in respect to the characteristic being tested with an equal number of cases in each of the strata. Until such findings are published, the conclusion of this study, that parental acceptance of children is independent of the educational level of parents, is suggested as a tentative conclusion and might be taken as qualification of Porter's earlier finding in that regard.

It is interesting to note that mothers who had been married 16 years or more were more accepting of children than were mothers who had been married less than 16 years. Apparently age is not the factor here, for the mothers' acceptance scores were independent of their ages. Since all the mothers had a child who was between 10 and 12 years of age, it can probably be safely assumed that the mothers who had been married longer probably had children in their families who were older than their 10-year-old child. Perhaps these mothers were more experienced, less anxious about the younger child, and hence could behave in a more accepting manner toward him. In other words, they may have learned to "accept" their younger child as a result of the experience of rearing the other child or children.

In general the chi square analysis demonstrated that the degree to which both fathers and mothers accept their children is independent of the characteristics tested in this investigation with the exception of length of marriage for the mothers.

Summary

The Porter scale for measuring the parental acceptance of children was administered to the parents of 256 carefully selected families in four midwestern states who lived in rural areas or in towns with populations not over 10,000 and con-

sisted of a complete family with two or more children, one of whom was in the fifth grade during the 1954-55 school year. A great amount of diversity in the characteristics of respondents in the sample was achieved. No particular segment of the sample which was checked appeared to be grossly out of proportion from what might have been expected from a random sample drawn from the universe defined for this study.

The scores of the fathers and mothers showed considerable variation. Out of a possible range from 40 to 200, the observed range of acceptance scores was from 68 to 179. When the scores for both parents were plotted by their frequencies, a well-defined distribution with a clear central tendency and little skewness was found.

There was no significant difference among the mean acceptance scores for the respondents from the various states. However, mothers scored significantly higher and therefore were slightly more accepting of children than were the fathers.

Fathers' and mothers' degree of acceptance of children appeared to be independent of various social characteristics of the parents. This was more definitely established for the fathers than for the mothers. For the latter, one characteristic, length of marriage, appeared to be related to the degree to which mothers accept their 10-year-old children. Mothers who had been married more than 16 years were significantly more accepting than were mothers married less than that period of time.

This study is part of a larger investigation which has been in progress for several years and is directed toward the measurement and understanding of the influence of family variables on the personality development of children. It has specifically attempted to increase our knowledge of parental acceptance of children.

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Spring Events

Red Cross Campaign for 1956. March, traditionally, is Red Cross month. In 1956, the 75th anniversary year of the Red Cross, it expects to need more funds than it received in 1955 to carry on its local, national, and international work. The 1956 slogan is *"On the Job—Join and Serve."*

Girl Scout Week—March 11 to 17, 1956. March 12 is the 44th birthday of 2,642,616 Girl Scouts. Monday of the Girl Scout Week has been designated "Homemaking Monday."

Community Health Week—March 18 to 25, 1956. Sponsored by the U. S. Junior Chamber of Commerce and the National Health Council, Community Health Week has as its theme, "Let's Do More About Health in Our Town."

Second Annual Nutrition Conference sponsored by the Wayne University College of Medicine, Detroit—April 13. AHEA members are invited to attend. Write to Department of Physiological Chemistry, Wayne University College of Medicine, Detroit 7, Michigan.

National Mental Health Week—April 29 to May 5 and the nation-wide Mental Health Campaign during May. This year's slogan is "The Mentally Ill Need Your Help—Join—Give."

National Conference of Social Work 83d Annual Forum—May 20 to 25, 1956, St. Louis, Missouri. Theme of this year's meeting will be: "The Challenge of Change! How social welfare meets the challenges facing it today—the challenges of a changing economy, a changing population, a changing world."

In this study home economists check the suitability of a new industrial product to adaptation in a home appliance. Studies such as this one are preliminary to many improvements in equipment items of everyday household use.

Cooking with Heat from Tubular Infrared Quartz Lamps[1, 2]

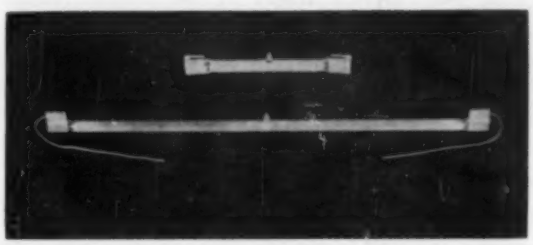
Elizabeth Beveridge, Mary Purchase, and Eloise Lorch

Miss Beveridge is a professor and head of the household equipment department at Iowa State College. Miss Purchase, formerly a graduate assistant in the same department, is now an associate professor in the department of home management at the University of Tennessee. Miss Lorch is now a graduate assistant in the household equipment department at Iowa State College.

A NEW type of lamp—a tubular infrared quartz lamp—as a source of infrared radiation was introduced recently. In exploring possible uses for the new lamp the question of cooking naturally arose, since cooking is an important use of applied heat. Could these lamps find practical use in home cooking?

Exploratory research work on cooking was started even before the lamp was introduced to the market. Since the lamp was so new, there was no previous work on which to build. In setting up this project, it was assumed that any method of cooking that would take the place of current methods would have to present definite advantages in shortened cooking time, improved quality of food, or convenience. It was further assumed that advantages would need to be of such a magnitude that they could be recognized readily and appreciated by large numbers of people who would form the potential market for cooking equipment using a new source of applied heat.

Answers were needed to such questions as: "Can all kinds of cooking be done with heat from this source? Are all types that are possible equally practical or are the advantages greater in some types than in others? Will foods react differently to infrared heat than to heat from usual sources? Are there any limitations to the kinds of foods that may be cooked this way? Are special utensils needed? Are methods of use so different that the homemaker would have to change her habits of work?"



1. *Infrared quartz lamps. Above, short lamp used in hot plate and broiler-rotisserie; below, long lamp used in range oven.*

Experimental Equipment and Procedure

The lamp used for this study consisted of a long slender tube of translucent, milky-white quartz through which ran a coiled tungsten wire. The ends were enclosed in metal which snapped into metal clips to make the electric contacts. The tubes were round in cross section, with a diameter of about $\frac{3}{8}$ inch. Developmental sample lamps of two sizes were used: 350-watt lamps with a length of approximately $5\frac{1}{4}$ inches; 1350-watt lamps about $14\frac{5}{8}$ inches long. (See photograph 1.) In order to do cooking, the lamps had to be placed in equipment appropriate to the kind of cooking to be done.

Three types of equipment were used, and each had a control unit of conventional construction.

[1] Journal Paper No. J-2858 of the Iowa Agricultural Experiment Station, Ames, Iowa, Project No. 1249, Contribution of the Home Economics Research Department.

[2] A grant in aid by the General Electric Company for the support of this work is gratefully acknowledged.

The first type was a two-unit, three-heat, open-coil hot plate, one unit of which was replaced by a set of three of the 350-watt lamps. These were so connected as to produce high, medium, and low heat. A pad of white Fiberfrax insulation under the lamps served as a reflector, and a red Vycor glass plate over the lamps reduced the glare and protected the lamps from possible damage. The second unit of the hot plate was unaltered.

The second type of equipment was the portable broiler-rotisserie. In one of two identical units, the open resistance coil unit was replaced by a bank of four 350-watt lamps. (See photograph 2.) These lamps were mounted parallel to the ends of the broiler lid and backed by a reflector of polished aluminum bent accordion fashion so that each lamp could be mounted in an inverted trough. The reflecting surfaces redirected upward rays to the cooking plane. The second broiler was used with its original unit.

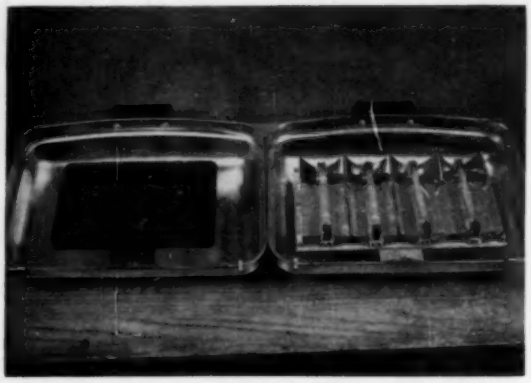
The third type of experimental equipment was the oven. An electric range of a current model was equipped with a lamp unit replacing the broiler unit. Three of the long lamps were used in this unit. At different stages in the project, lamps were used without a reflector, with plain aluminum foil as a reflector, and with a bent reflector similar to that in the broiler-rotisserie. Most of the work reported here was done with the bent reflector. The range was specially wired to permit the oven to be operated with the regular switches. The lower oven unit was of the conventional type. A second range of the same make and a similar model was used to provide a comparative oven with conventional units.

Methods of Measuring Results

Time required to cook food to definite internal temperature can be measured by the use of well-known instruments. For much of this work, thermocouples and suitable temperature-indicating instruments were used.

Quality of food is more difficult to measure, since it involves the variable element of human judgment. With the aid of the foods research laboratory, procedures for triangle testing were devised to measure food quality.

The purpose of the triangle taste test as used here was to determine whether judges could differentiate between food cooked with the infrared lamps and that cooked by conventional electric units, and, if so, which the majority preferred. Untrained judges were used because they would be more representative of the large group of people who might be expected to form the potential market for the equipment if and when it may be offered for sale.



2. *Lids of the two broiler-rotisseries with heating units. Left, conventional broiling coil; right, infrared quartz lamps mounted in reflector of bent sheet aluminum.*

In applying the triangle test with eight judges and three trials each, it was considered that if two-thirds of the decisions were correct it would indicate an ability to differentiate between samples of food cooked by the two methods.

Hotplate tests and results. Under controlled conditions, speed of heating water was observed using pans of similar size and shape but of different materials. These tests were all done with high heat which was, for both types of units, 1,018 watts. When water temperature reached 80°C, the unit was turned off, but temperatures were recorded until a maximum was reached.

Except for the enamel pans, time for heating was always less with the standard unit. In all pans, maximum temperature reached was greater with the standard unit. (See the table.)

A test designed to simulate the use of a warped pan on the lamp unit showed that considerable heat was transmitted by contact with the Vycor plate and, therefore, warped pans would not be so efficient as flat-bottomed ones.

With the Vycor plate removed so that rays were unobstructed in reaching the pans, water in aluminum pans heated only slightly faster, while that in glass pans heated noticeably faster (5 minutes and 28 seconds without the plate, 7 minutes and 32 seconds with it). However, the practicality of omitting the plate is questionable, since the lamps were then exposed to possible damage and the glare was blinding to the worker.

A few tests were made on the boiling of vegetables. These showed no difference in time for

cooking potatoes by the two heat sources and no apparent effect of infrared rays on color of vegetables cooked in glass pans.

The experimental units were considerably lower in wattage than units commonly found on electric ranges and were correspondingly slower. Since no time advantage was found for the lamp unit in the tests done, it was deemed inadvisable to do further work until a lamp unit could be developed with a high enough input to compete successfully with range units in use.

Portable broiler-rotisserie. Evenness of browning, time for cooking, and effect on quality of food were considered important factors to be studied in the portable broilers.

Under both lamp and standard units, browning of bread was slowest but most uniform at the lowest rack position. At the high rack position under the lamps, bread was burned in the center before there was any browning around the sides.

Since air does not absorb appreciable amounts of radiant energy, it might seem that distance from the source would not be an important factor. However, another characteristic of radiation was operative in this situation, that is: rays—whether heat or light—spread in all directions from the source so that the intensity at any point is inversely proportional to the square of the distance (the inverse square law). Then, too, the design of the reflector may have caused some concentration of reflected rays in the plane of the upper broiling position.

Pans ranked as to speed of heating water to 80° C and maximum temperature

PAN	TIME		MAXIMUM TEMPERATURE
	minutes	*seconds*	°C
STANDARD UNIT			
1. Cast iron	6	21	91.0
2. Aluminum—1	6	30	94.0
3. Stainless steel, bright copper bottom	6	39	95.5
4. Aluminum—2	6	46	95.0
5. Glass, without wire guard	7	04	95.5
6. Enamel—2	7	30	97.0
7. Enamel—1	7	37	97.0
8. Glass with wire guard	9	11	95.5
LAMP UNIT			
1. Aluminum—1	6	45	91.2
2. Enamel—2	6	57	89.5
3. Enamel—1	7	00	89.0
4. Aluminum—2	7	08	90.0
5. Cast iron	7	15	85.5
6. Stainless steel, bright copper bottom	7	27	90.0
7. Glass, without wire guard	7	32	91.0
8. Stainless steel, dull copper bottom	7	54	90.0

Since broilers are most critically judged on the basis of meat cookery, most work was done on this type of food. Frankfurters at the lowest rack position reached an internal temperature of 215°F (101.6°C) in about 15 minutes under the lamp unit, 21 minutes under the standard unit. A higher location of the rack shortened the time but, as in the case of the toast, cooking was more uneven. Ground beef patties, 3¼ inches in diameter and ¾-inch thick, weighing 100 grams each, were cooked to an internal temperature of 200°F (93.3°C) in 20 minutes under the lamp unit and 29 minutes under the standard unit.

In taste-testing of 42 samples, the correct "different" sample was chosen only 23 times, indicating that the judges could not differentiate between meat patties cooked by the two heat sources.

Range oven. There seemed to be more possible problems in connection with cooking in the oven than by either of the two other methods. First, there was the question as to whether rays from the lamps would penetrate foods so as to do the entire baking with heat from the lamp broiler unit. Tests were made using scalloped potatoes, macaroni and cheese, cake, baking powder biscuit, and custard. By varying position of food, location of oven thermostat, time unit was on, and other factors, methods were developed by which all of these products were cooked so as to be acceptable, though usually not so good as those that are baked in usual ovens. There was no apparent advantage great enough to make up for the loss in quality of the food.

From work that had been done with both the broiler and the oven it appeared that the lamp unit had a definite time advantage in broiling of meat.

Since the top unit of the electric oven may be used not only for broiling but also to supply some heat during baking, the next question to be answered by tests was, "What would be the effect on food of operating the oven with most of the heat supplied by a conventional bottom unit but with some top heat from a lamp unit?" White and chocolate cake and yeast bread were selected as test foods. The judges were not able to differentiate between products baked in the conventional oven and the one with lamps—not a surprising result, since the amount of top heat during baking is small. However, the tests did indicate that there were no disadvantages to baking with top heat furnished by lamps.

From this point on, study was concentrated on broiling in the range oven. Ground beef patties,

steaks, halibut, and sausage were broiled. Tests were run with a wattage of 4,000 in both lamp and standard units, and then the conventional unit was replaced by a 3,000-watt unit and resistors placed in the line leading to the range with the lamps to reduce their input to 3,000 watts. In no case were judges able to select the correct "different" product as much as 50 per cent of the time.

Suggested possible advantages for the lamp unit if installed in a range oven led to experiments with the thawing of frozen foods. Peaches were used as the test food. Those thawed under the lamps in 2 minutes and 15 seconds were triangle-tested with those thawed for several hours at room temperature. In only 42 per cent of the trials did judges choose the correct "different" sample.

A suggestion that the lamps might readily toast cheese sandwiches in a vending machine led to tests on the toasting of unwrapped and cellophane-wrapped cheese sandwiches. Those wrapped toasted as well as the unwrapped ones showing that the cellophane is apparently no barrier to the passage of infrared rays.

Conclusions

1. With the equipment tested, the lamp unit showed no advantage for surface cooking. There was no great advantage shown for any one type of pan material as long as the red Vycor plate over the unit was used. With the plate removed, there was an appreciable gain in time when a glass pan was used. If material could be found that would be more transparent to the infrared rays than was the red Vycor plate, perhaps time could be materially shortened.

   Further work needs to be done with surface units comparable in wattage to standard range units before definite conclusions are drawn.
2. Meat broiling was more rapid with the lamp unit than with the conventional electric unit. This was the most significant advantage of the lamp unit that was found.
3. Untrained judges were unable to differentiate between foods cooked by lamp and by conventional units. This suggests that there is neither advantage nor disadvantage for the lamp units as to quality of food.
4. The small amount of heat supplied by the lamp unit during the regular baking process made no measurable difference in baking. The advantages of the lamp unit for broiling apparently can be capitalized on without altering the baking characteristics of the oven.

In order to determine with greater accuracy the comparative times for broiling meat to the same internal temperature, further studies are being made. In cooking food for the taste panels, it was necessary to concentrate on producing food that was alike in appearance. In doing that, accurate time comparisons were not made.

American Students Study Abroad

The Institute of International Education reports that the preliminary summary of its 1954-55 Survey of U. S. Citizens Studying Abroad indicated that 8,219 American students studied in 47 countries and political areas during the 1954-55 academic year.

More than half (59.7 per cent) were enrolled in institutions in Europe; 17 per cent were studying in Mexico; and 16.8 per cent in Canada. Over 1,000 Americans were reported in institutions of higher education in four countries: Mexico, Canada, Italy, and the United Kingdom.

Liberal arts, medicine, theology, social sciences, and the creative arts were the largest categories of studies. They totaled 69.2 per cent of the American students abroad.

The survey was begun in November 1954, with a total of 1,000 institutions in all parts of the world being polled. The IIE reports that the institutional mailing list was prepared from information contained in *Universities of the World Outside U.S.A.* (published by the American Council on Education, Washington, D. C.) and supplemented by data from UNESCO's Exchange of Persons Service, the Institute's Information and Counseling Division, and IIE's *Handbook on International Study*. The final report of the survey will appear in the 1955-56 issue of *Open Doors*, published by the IIE, 1 East 67th Street, New York City.

Benjamin R. Andrews Fellowship Established at Teachers College

Teachers College, Columbia University, has announced the establishment at the College of the Benjamin R. Andrews Fellowship in Consumer Education by the Consumers Union of the United States, Inc.

Worth $2,000 the fellowship will be available for the 1956-57 academic year and is renewable for one year. The fellowship will be used for study on the master's or doctor's levels in the department of home and family life.

Dr. Andrews is professor emeritus of household economics at Teachers College. He was one of the founders of the American Home Economics Association and was its first secretary, treasurer, and editor of the first issues of the JOURNAL OF HOME ECONOMICS.

Joan Cassidy Joins AHEA Headquarters Staff

Joan Cassidy joined the AHEA headquarters staff on February 6 as publications assistant. Miss Cassidy replaces Mrs. Enid Miles, who left the Association when her husband was transferred away from Washington.

Miss Cassidy has a B.A. degree from Queen's College in Flushing, New York, and is completing a journalism degree at George Washington University in Washington, D. C. As publications assistant in the editorial offices of the AHEA, Miss Cassidy will edit the College Clubs pages of the JOURNAL and assist with other editing of the JOURNAL and with the miscellaneous publications of the Association. She will also be responsible for the printed program for the annual meeting and for press releases and supervision of the press room during the annual meeting.

American Standards for Institutional Textiles Approved

Specifications for institutional textiles were approved as American Standards in December 1955.

The new Standards cover furnishings such as bedspreads and upholstery; utilities such as bath mats, towels, and shower curtains; and uniforms and work clothes. The American Hotel Association sponsored this L24 project.

Clifford Gilliam, chairman of the committee which developed the standards, pointed out that the standards—the first national standards for performance of institutional fabrics and products—will be of great assistance to both wholesale distributors of textiles and buyers for hotels, restaurants, and educational and other institutions.

TV Program for Students of Home Economics in Chattanooga

On its daily TV program on WDEF-TV, the Electric Power Board of Chattanooga sponsors weekly programs for the home economics students in all the schools in the Chattanooga area.

Know Your Products Quiz

[Based on ads in this issue]

1. Who offers recipes for "bunny" and "Easter egg" cookies?
2. What do all good cooks love?
3. What is the criteria of a good source of a given nutrient?
4. How can you find out what went wrong with your piecrust?
5. How can you win the price of a new hat?
6. Who has news for you if you're counting calories?
7. What Lenten recipe features an instant shortening?
8. What's the clue to the right amount of detergent?
9. What's a new way of merchandising "sawmill chicken"?
10. How can you serve humanity, your country, and yourself?
11. Whose presses have three new books for home economists?
12. Who offers materials for a personal hygiene course?
13. Where can a teen-ager get a starching folder?
14. Why are air-tight packages used for cake mixes?
15. How can the teen-age girl learn to be figure-wise, figure-happy?

[If you're unable to find the answers, see page 228.]

Note: In "Attitudes of Single Men toward Child Guidance" by James Walters and Barbara Bridges in the February 1956 JOURNAL, pages 109-113, mention of the fact that a portion of the data was taken from Miss Bridges' master's thesis at the University of Alabama was omitted.

COLLEGE CLUBS

MRS. ENID MILES, *EDITOR*

Open Your Eyes to Research

Ethel Russell

Mrs. Russell is head of the home economics section of the Midwest Research Institute and is a member of the Kansas City Group of the home economics in business section of AHEA. Her busy life and absorbing work at MRI in Kansas City were featured in an article in the October 1955 issue of *Charm* magazine.

ARE you interested in a challenging career which holds a promising future? If so, give thought to a home economics research career in business and industry.

This exciting new field for home economists offers both immediate and long-range opportunities for your future. Yes, it *does* mean lots of hard work before you reach the "top"—but it is fascinating, fun, and so rewarding! And the demand for qualified home economists in this field far exceeds the supply!

No, you need not be another Einstein to be a success, and research is not a frightening field. Look at it this way—it is a wonderful chance to put your knowledge and your own original ideas to work. We in the field like to think of home economics research as common sense in action.

What's Expected of the Home Economist?

In business and industry, home economists are for the most part concerned with two types of research—product development and methods research. The product may be one in the area of foods, equipment, textiles, housing, or household supplies. The method may pertain to the use of equipment, the operation of a food service establishment, the preparation of foods, or homemaking itself.

The home economist plays an important role in developmental research because management expects her to decide just what is needed in a new or better product. In order to make such a decision, it is essential that she know both the advantages and limitations of the "product" in question and just how well a new product will fulfill a useful purpose in the home. She must consider whether or not the proposed new product will improve the competitive and profit position of her company. Also, the evaluation of consumer appeal and potential satisfaction must not be overlooked. The actual developmental work may be done by the home economist alone or with other home economists, or she may assist chemists or engineers in the work. During and after the developmental work a major responsibility of the home economist is to appraise the product as to its acceptability for the consumer.

Methods research is most important, for not only must consumers be informed about the new products and "sold" on their advantages but they need to be taught how to use and care for these products. Establishment of proper use procedures for the new product is the direct responsibility of the home economist. Companies need assurance, not only that their products are good, but that they will be used effectively. An excellent food product can be ruined by incorrect preparation. The finest of laundry detergents cannot produce the best results unless the method of usage is correct. Therefore, it is almost axiomatic that the better the way a product is used, the better the final result for both the consumer and the manufacturer.

What the Home Economist Must Have or Know

The home economist in industrial research must be able to place herself in the consumer's position, usually that of a homemaker. To provide this point of view, she must have first-hand knowledge of the consumer's likes and dislikes, her interests and disinterests, and what she wants and doesn't want. The ability of the home economist to forecast the consumer's point of view is all-important because management depends largely upon the home economist's judgment to guide company decisions on new and better products and the best ways of using these products.

Original ideas cannot be overstressed. Alert home economists furnish ideas for new and better products and methods. This is the fascinating challenge

of a career in industrial research. The research home economist has the opportunity to think creatively. This means she must be able to recognize where improvements are needed and to formulate means for attaining them.

Perception and judgment are necessary factors in any research project. Technical knowledge, know-how, and a proper educational background are expected. It is necessary that the home economist have the ability to understand the objectives of an assignment and the know-how to plan the program to accomplish these objectives. Not only must she appraise the results of the work with a positive attitude, but she must also recognize just where and when to stop the work on a particular project.

Considerable judgment is necessary in the objective appraisal of these results to determine how successful the new product will be in meeting the needs of the consumer.

Clear and concise report writing and the ability to talk effectively about the ideas developed in the laboratory must also be one of the home economist's strong points. She can best sell her ideas if she has the ability to draw together conclusively the results of her work, to form a distinct solution or picture of the work performed. She must explain the ideas clearly and simply—in words others can understand.

And the Rewards?

It is important to make a living, but it is much more important to make something out of life and to enjoy life while you work. Research is the result of the combined efforts of a number of scientists. In research, you do not work alone—but help your associates with their work as they help you with yours.

Specifically, the successful home economist engaged in industrial research receives personal satisfaction from the contributions she makes toward the creation of new products. And she brings happiness to those who use the products. You will find if you become a research home economist that you are contributing toward the betterment of the American home. The very nature of the work helps bring a higher standard of living to all mankind. And, indeed, our whole profession is dedicated to home and family life. We, as home economists, have an opportunity to give more of our time and training, and to gain more in satisfactions than almost any other professional group.

Promotions and professional advancement for home economists in business and industry are more rapid in research than in many other areas of home economics. Opportunities are many and varied, as are the salary ranges. However, as in all professions, the progress you achieve will depend upon your own ability, ingenuity, resourcefulness, and industry.

Mrs. Ethel Russell (left) and an assistant in the home economics section of the Midwest Research Institute check samples during work on development of a new food product.

Progress Report

The six-point program of work adopted last June by the college clubs section members was used as a basis for a progress report to the AHEA executive committee at its midyear meeting in January. The report, compiled by Joyce Collins, president of the section, and brought up to date as of February 1 showed:

Affiliated clubs, February 1, 1956.....371
Affiliated clubs, February 1, 1955.....388
Total number of clubs, June 1955.....466
Graduating seniors who joined AHEA, as of
February 1, 1956.....3,098
February 1, 1955.....3,098
Contributions of the college clubs section to the AHEA International Scholarship Fund, 1955-56, as of February 1.....$321.83

Replies from the clubs for the midyear progress report showed that the points in the program of work that were being worked on with greatest enthusiasm were:

Recruitment of high school girls
Foreign student program
Public relations program
Attendance at, and participation in, meetings of the state home economics associations
Increasing pride in the profession

Abstracts of Doctoral Theses Related to Home Economics, 1954-55

Following are abstracts of doctoral theses in home economics and closely related fields presented, in most cases, during the academic year 1954-55. The selection of abstracts was made mainly from titles of 1954-55 theses in home economics and related fields as compiled by the Home Economics Research program of the Agricultural Research Service, U. S. Department of Agriculture, and the Home Economics Education Branch, Office of Education, U. S. Department of Health, Education, and Welfare. The abstracts published here were presented by members of the American Home Economics Association. They represent research in various areas of home economics. With each abstract is the title of the thesis, the name of the author, and the name of the college or university that awarded the degree. Some abstracts are not included here because longer articles are in preparation.

Education

The Role of the Home Economics Teacher in the Education of Slow-Learning Girls in Ohio Public Secondary Schools with Implications for Teacher Education, HELMI L. KOIVISTO, *Ohio State University.*

The study attempted to clarify the role of the home economics teacher in the education of slow-learning girls through analyses of: (1) beliefs and problems in instructing slow-learning girls, (2) practices and methods in instructing such students, and (3) the preparation of home economics teachers for teaching slow learners. The slow learner was defined as an individual between 50 and 90 IQ who is unable to reach the achievement level of average students because of intellectual limitations.

Data were obtained from a questionnaire survey of 377 high school home economics teachers and from observations and interviews in 23 schools in Ohio. Over one-half of the respondents reported concern with 10 out of 13 problem areas in teaching slow-learning girls. Over three-fourths indicated difficulty with reading disabilities, meeting individual differences in large classes, and suitable techniques for teaching slow learners. Nutrition, time and energy management, and money management were considered the most difficult curriculum areas to teach to such students. As sources of help to teachers in instructing slow learners, college preparation and in-service education seemed to be of limited effectiveness.

The evidence gathered in the study supports the need for teacher education to assume greater responsibility in the following ways:

1. Development of a better understanding of the characteristics and needs of exceptional children
2. Much greater attention to the problem of reading disabilities
3. Development of effective teaching procedures and resources for meeting individual differences in large classes
4. Full recognition given to the personal and family life needs of youth

Conclusion. Slow learners need not be problems if they are accepted and understood. It should be a challenge to home economics teachers, and one of their obligations, to assist such students to achieve acceptable homes and wholesome family life. However, instruction must be brought to their level of understanding.

State School Lunch Supervisor Internship: A Plan Based on Study of Responsibilities of School Lunch Directors and Supervisors, MIRIAM SCHOLL, *Teachers College, Columbia University.*

This study began with an investigation of the need for trained state school lunch supervisors. It is based on the philosophy that the school lunch program is an integral part of the educational program; that the benefits of the program are in direct proportion to its quality; and that adequate supervision is important in order to safeguard child health, to insure prudent expenditure of funds, and to fully integrate the program into the total educational program. A plan for internship training was then developed based on required qualifications in academic training and in practical experience of state school lunch supervisors or directors, together with a study of their duties and responsibilities.

The procedure in developing the internship plan began first with a collection of facts gathered by means of a questionnaire about school lunch supervision on the state level in the 48 states. These data were used as a basis for further compilation of information through conferences; interviews and field visits; study of annual reports; study of internships in other fields; compilation of qualifications, duties, and responsibilities based on state requirements; and standards recommended by committees of the three professional organizations most concerned with the school lunch program. Internships already established in other fields were used as a basis for recommendations on decisions common to all internships. A jury of competent persons in the field evaluated the plan after it was developed.

Specific recommendations are made in the plan for

internship. A state department of education, a college or university department, or two or more state departments of education acting jointly are suggested as possible agencies to sponsor training. Provisions for college credit during the period of training for regular college courses and for some of the practical work are also suggested. Adequate supervision and guidance are considered to be an important part of the plan. Status of a junior staff member on the school lunch agency staff is advised. The total length of appointment in the plan is 50 weeks, with time allocated for orientation in state agency offices and USDA area office, field observation, practice in local systems, practice in state agency office, and finally supervisory responsibility in the field. Prerequisites to training consist of a bachelor's degree from an accredited school with courses in foods, nutrition, institution management, food cost control and education, and a minimum of three or four years of work experience. Flexibility in the formulation of the plan is recommended in order to best adapt the plan to requirements of specific situations and the needs of any intern.

A Teacher's Guide of Student Nurses' Learning Experiences in Diet Therapy Clinical Practice Related to Total Nursing Care of Patient, for Use in Schools of Nursing, ELEANORA SENSE, *New York University.*

This research study started with a clarification of the total nursing care of patients to which concepts of learning experiences in diet therapy clinical practice, gathered from professional literature, nurse educators, student nurses, and teaching dietitians, could be correlated. The study resulted in a manuscript for a teacher's guide which was evaluated by leaders in the field of nutrition education and nurse education.

Student nurses preparing for professional nursing in hospitals, industry, office, private duty, or teaching have unique opportunities to develop in an educational-clinical environment within a democratic society. The curriculum of nurse education provides studies in areas of physical and social sciences.

This study implies that dietitians who have responsibilities of teaching the educated product of a related profession (in this case, nurses) in the same clinical-learning environment should be encouraged to select learning activities correlated to the total care of the patient, thereby meeting educational needs of student nurses as well as providing them with opportunities for growth and development.

In an integrated program students receive clinical practice in medical and surgical nursing of patients as well as benefit from clinical practice in diet therapy, for example, feeding the critically ill or emotionally disturbed patient, teaching at the bedside to encourage patients to eat prescribed diets, observing food habits of patients to determine psychological reasons for rejection of specific foods, and recording intake of nutrients on patients' charts. Student nurses experienced difficulty in correlating diet care to total care of patient if activities were limited to isolated food service and production centers in hospitals.

Attitudes and Experiences of Ten- and Eleven-Year-Old 4-H Club Members Enrolled in Clothing Projects in McLean County, Illinois in 1953 with Implications for Program Planning, LUCILE HIESER SEVOIAN, *Cornell University.* [Mrs. Sevoian held the AHEA Ellen H. Richards fellowship for 1953-54.]

This study dealt with an investigation of the opinions and experiences of ten- and eleven-year-old 4-H Club members enrolled in clothing projects in McLean County, Illinois. The purpose of the study was to determine what concepts these members had of 4-H Club work and to discover indications of satisfactions derived from the 4-H experience in relation to developmental tasks.

The data were secured by means of personal interviews conducted by the author with the club members at the close of the 1953 4-H Club year. Three-fourths of the interviews were obtained in schools and one-fourth in homes. Data were obtained from 128 girls or 98 per cent of all the ten- and eleven-year-olds enrolled in 4-H clothing projects in McLean County. The facts that responses were obtained from such a high percentage of the potential population of the study, were willingly given, and were consistent within the individual interview contribute evidence to the validity and reliability of the data.

This study demonstrated the possibility of obtaining data on opinions and experiences of 4-H Club members from even the youngest age group in 4-H, the willingness of club members to co-operate in such a study, and the value of letting club members speak for themselves.

Indications were found that most of the club members received satisfactions from the 4-H experience in relation to the areas of developmental tasks within the scope of this study. However, they may have received these satisfactions in different ways and in varying degrees. Although girls joined 4-H primarily because of the influence of others, they re-enrolled a second year because of their own interest. Classifications of members who were most active participants in the 4-H Club program were members in their second year of club work, members receiving first or second place ratings on garments, farm members, and members in the high family socioeconomic group. Of the members who apparently had the least satisfying 4-H Club experience, some dropped out of 4-H Club work while others continued in 4-H. Although some members had very satisfying experiences in 4-H Club work, they dropped out because of competing interests or circumstances beyond their control.

Major implications of the findings for planning the 4-H program are to revise project requirements in the second clothing unit, to get more information to moth-

ers on recommended clothing practices and construction procedures, to help beginners in 4-H have a better understanding of the 4-H program, and to give more recognition in the local club for completion of all 4-H requirements.

The Role of Chapter Parents in Future Homemakers of America, PATRICIA A. TRIPPLE, *Teachers College, Columbia University.*

[An article based on Dr. Tripple's thesis appeared in the January 1956 issue of the JOURNAL under the title "Parents Can Help Too." See pages 15 to 18 of the January issue.]

The Functions of the College Teacher of Home Economics Education, MARY M. WYLIE, *Teachers College, Columbia University.*

This study was carried out on ten different college campuses within eight states of the North Atlantic Region. The interviewer stayed on each campus from three to five days. During this time the teacher educator, home economics administrator, and one education staff personnel member were interviewed. The interviewer traveled to the teaching centers with the teacher educator and sat in on conferences the teacher educator had with student teachers and co-operating teachers. The interviewer went to college classes and to committee meetings of the teacher educator. Functions and competencies of the teacher educator were observed on the job.

Specific purposes of this study were (1) to determine what the job currently entails in the light of the reality of the job at present and its emergent responsibilities, (2) to identify the specific competencies of college teachers of home economics education as they operate on the job, and (3) to make recommendations for the preparation of college teachers of home economics education at the graduate level.

The teacher educator is called upon to use varied competencies in performing her many functions. Functions common to all teacher educators in this study include (1) supervising student teachers, (2) teaching courses in methods, (3) working with co-operating teachers and secondary administrators, (4) working with committees in the division of home economics and the division of education, (5) keeping staff informed of the developments in home economics education and current trends in education, (6) recruiting, (7) placing graduates, and (8) keeping aware of state requirements. Some teacher educators have functions which are not common to all, such as itinerant supervision and administrative functions.

Education staff personnel and home economics administrators say that the teacher educator should get along well with people. Education staff personnel would like her to be personally appealing, to have a good background in general education, to have a thorough understanding of home economics, to have the ability to defend the things in which she believes, to understand and to use group dynamics, and to have obtained a doctor's degree. Home economics administrators would like the teacher educator to have experience as a subject-matter teacher, to understand and to have the ability to teach a family-centered program, to be able to adjust to larger classes, and to be mentally and physically healthy.

Teacher educators would like to be more competent in family-centered teaching, in general education, in evaluation, in all areas of home economics, in methods of teaching, and in the conducting of research.

Recommendations were made for the preparation of college teachers of home economics education at the graduate level. These recommendations dealt with flexibility of the graduate program, the importance of a good adviser, the educational background of the future teacher educator, courses and experiences to help her to develop competencies, supervision under guidance, work experiences, home experience, and general education.

Family Economics — Home Management

Homemaking Work Units for New York State Households, KATHRYN E. WALKER, *Cornell University.*

Data relating to use of time for homemaking and collected through interviews conducted in 250 New York State households were analyzed for the purpose of developing up-to-date homemaking work units. A homemaking work unit is defined as the average amount of time required to do specified homemaking tasks under average conditions. The units measure roughly the quantity of work to be done in the home; they measure neither satisfaction nor quality of work. Work units were developed for six major areas: meal preparation, dishwashing, regular care of the house, physical care of family members, washing, and ironing. A study was made of the factors which relate to the amount of time used daily for each task. The factor, such as number of persons in the household, that was found by these analyses to have the greatest influence upon the amount of time was then used as a basis of the work unit for each task.

Exploratory use was made of the work units with 24 homemakers who had time pressures of various kinds. After the homemakers had kept a one-week record of the time used by all workers in the activities of homemaking, an interview was held with the homemaker. The units were also used in meetings with groups of people professionally interested in home management. To these groups the work units were presented as a tool designed to assist families in making decisions regarding the use of time.

The work-unit concept can be applied to geographic regions other than New York State. However, varia-

tions in customs make it desirable for units to be developed for the particular section in which they are to be used.

Family Relations and Child Development

The Adolescent's View of Father Roles in Relation to Socioeconomic Class, THEODORE BENJAMIN JOHANNIS, JR., *Florida State University.*

The purpose of the study was to ascertain the relationship between socioeconomic class and the usual participation of the father in performing and deciding who will perform certain tasks or functions in four areas of family living: household tasks, child care and control functions, economic functions, and social functions.

The data were obtained by the questionnaire method from 543 high school sophomores attending eight public and private high schools in Tampa, Florida. Students whose families met the following criteria were selected as subjects for this study: (1) family belonged to the white race; (2) marital status of father and mother never broken by death or divorce; (3) father, mother, and respondent reared in Odum's Southeastern Region; and (4) all siblings lived at home or one or more siblings lived away from home.

Middle-class fathers were found to perform alone and to decide alone which family member is to perform child care and control functions and economic functions significantly more often than did lower class fathers. Middle-class fathers also were found to share with other family members performance in significantly more economic functions than did lower class fathers.

In general, participation by fathers in performance and decision-making was found to be low, especially in the household task area of family living. More middle-class and fewer lower class fathers than were expected were found to perform or decide who is to perform two-thirds of the 53 tasks and functions included in the study. The reverse pattern was found for the remaining one-third of the items.

Food and Nutrition

Influence of Non-Protein Calories on the Nitrogen Economy of Protein-depleted Rats, HAZEL METZ FOX, *Iowa State College.*

The influence of non-protein calories on the nitrogen metabolism of animals depleted of their body reserves of protein and maintained on low nitrogen rations of varying caloric value has been studied.

Adult male rats were fed protein-free rations for 32 days with energy provided by carbohydrate alone or by a mixture of carbohydrate and fat. The first 18 days were considered as an adjustment period. Then nitrogen excretion was measured in an interval of unrestricted feeding and again after the energy value of the diet was reduced to approximately one-fourth of its original value. In one experiment the animals continued to receive the respective rations, in either full or restricted amounts, until death intervened.

After caloric restriction was imposed, animals receiving fat excreted appreciably less nitrogen than those receiving energy from carbohydrate alone. Under this set of experimental conditions fat seems to exert a protective action on the rate of nitrogen catabolism. Its influence continued over the remaining life span of the animals and was reflected in the relative life spans of the two groups, for example, 41 versus 27 days.

However, the picture was reversed when the energy value of the rations offered met the caloric needs of the animals. For example, during the period of unrestricted feeding, rats receiving carbohydrate only excreted somewhat less nitrogen than did those receiving the carbohydrate-fat combination. The picture was even more marked in the long-term study. Nitrogen was excreted at a faster rate over the remaining life span by animals receiving the high-fat rations ad libitum than by animals fed the fat-free ration. Animals fed predominately carbohydrate survived 174 days in contrast to 121 days for animals receiving fat.

Thus, it appears that the effect of carbohydrate versus that of carbohydrate and fat on protein metabolism must be defined in terms of specific experimental conditions.

The Nutrition and Health of Children in the Gold Coast, FAYE W. GRANT, *University of Chicago.*

The nutritional status of 60 West African children from under 1 to 16 years of age was studied during 10 months, with quantitative dietary data obtained during a period of 3 to 10 days in specific households. The majority lived in nonliterate village homes, although one literate urban household was included.

In the villages the diets provided from 432 calories per child per day for the average age of four years to 1,264 calories for children of about seven years of age; protein ranged from 11 to 41 g per child per day. Few nutrient totals approached commonly accepted levels of adequacy. In relation to these village diets, urban diets were more generous. The bulk of the calories was from foods of high starch content; smoked fish of a low moisture content provided significant amounts of protein and calcium. Legumes, succulent vegetables, and fruits were found in the area, although they were not used extensively in these diets.

Village children over one year of age appeared small. Except for the urban group, the level of health was poor. Symptoms suggestive of a lack of various nutrients were observed. Anemia was a marked finding, and malarial and intestinal parasites were common. The diets of the younger children consisted of bulky foods with low nutritional values.

The author recognized the fact that the problem of the children was complex. However, she concluded that the foods of the area offer the possibility of a more nutritious diet and that traditional dishes are enjoyed by older children. Changes in the dietary pattern of the younger children were recommended with emphasis on the introduction of more concentrated foods at an earlier age. It was suggested that these changes could be brought about through existing educational programs.

Chemical and Physical Properties of Various Fractions of Connective Tissue Proteins, MADGE MILLER, *Iowa State College.*

Tenderness in meats is one of the most desired qualities. The concept has long been held that connective tissue plays a distinctive role in the tenderness of meat. Historically the emphasis has been on the collagen and elastin fibers; however, the literature reveals a paucity of corroborative assessments of the collagen and elastin components and complete negligence of the ground substance moiety.

Tissue aliquots of certain bovine skeletal muscles were dispersed with differing extracting solutions in shake flasks with glass wool for the entrapment of residual connective tissue. Nitrogen content of the entrapped residues, following certain extractions and certain enzymatic digestions, was quantitated by Kjeldahl and hydroxyproline determinations; on the hyaluronidase digests the apparent reducing sugar content was also determined.

Results of these investigations indicate quantitative accounting of the nitrogen in bovine skeletal tissue may be effected by acceptance of the following fractions: a potassium chloride-soluble portion, approximating 80 to 85 per cent; a collagen and elastin fibrillar fraction of 5 to 6 per cent; an alkali-labile, autoclave-labile moiety of 8 to 12 per cent. It may be conjectured that the fraction which does not contain hydroxyproline and which can be solubilized by autoclaving and by alkali may be an integral portion of the ground substance, which is the very matrix of connective tissue. The hypothesis is tenable that certain constituents of the ground substance, though minimal in quantity, may well play a determining role in architectural aspects, and hence in the tenderness of meats.

The Microbiological Assay of the Amino Acids of Five Genera of Yeasts Grown under Controlled Conditions, LOUISE MOJONNIER, *University of Chicago.*

The complete amino acid composition of the proteins of four genera of yeast not previously reported was determined by the microbiological assay method. The yeasts studied, *Candida krusei, Pichia membranaefaciens, Saccharomyces carlsbergensis,* and *Hansenula anomala,* were grown under standardized conditions in synthetic Wickerham's medium containing glucose and ammonium sulfate. *Hansenula anomala* was grown on identical medium containing potassium nitrate. Brewers' yeast was assayed for comparison, and several of the so-called non-essential amino acids were reported for the first time.

The total nitrogen of the yeasts varied from 5.57 per cent in *Pichia membranaefaciens* to 7.45 per cent in *Candida krusei,* somewhat lower than the brewers' yeast value of 8.76 per cent. Amino acids accounted for 73 to 79 per cent of the total nitrogen in the various yeasts. All yeasts studied contain the eight so-called nutritionally essential amino acids. All are relatively good sources of lysine, and all are relatively poor sources of cystine and methionine.

Hansenula anomala grown in the ammonium sulfate medium contained the same amount of protein as that grown in the potassium nitrate medium, but the former contained more glutamic acid, glycine, isoleucine, leucine, phenylalanine, tyrosine, and valine, and less alanine and arginine than the latter, although the growing conditions and other components of the media were identical.

In human diets yeast protein can serve as a valuable supplement to vegetable proteins because of its high lysine and relatively low tryptophane content. It cannot, however, replace all animal protein in the diet because of its deficiency in methionine and cystine. It is possible that some yeast not yet assayed synthesizes large quantities of sulfur containing amino acids or that the methionine value of yeast can be increased by changing the medium in which it is grown. In this study no yeast producing large quantities of methionine was found nor did the change in the growing medium affect this amino acid. It is important, therefore, to continue the analyses of yeast proteins.

An Investigation of the Nature, Utilization, and Accuracy of Nutritional Claims in Magazine Food Advertisements, RITA S. ROSENBERG, *New York University.*

The purpose of this investigation was to study changes in the nature of nutritional claims made in food advertisements from 1901 to 1950. A 25 per cent sample of food advertisements in a leading woman's magazine was examined, and specific nutritional statements were evaluated with respect to accuracy by reference to accepted nutritional knowledge at the time the claim was made. Authorities included government bulletins and textbooks in wide use.

The following ten major types of errors were noted:

1. Testimonials to the efficacy of a product or reference to "doctors" or "authorities"
2. Statements playing on the credulty, ignorance, or fears of the public
3. References to any one food as satisfying all nutritive requirements, as being indispensable, or as being perfect
4. Pseudo-scientific or confusing language
5. References to the unique quality of foods

6. Comparison of one food with others to indicate the superiority of the advertised product
7. Ambiguity of certain terms
8. References to the therapeutic or remedial value of foods
9. Exaggeration and over-simplification of food values or functions
10. Statements which exceed established fact or which reflect experimental work

On the basis of the data, the investigator believes she is justified in formulating the following conclusions: Food advertisements generally made non-nutritional claims from 1901 to 1950, with greater specificity seen as a definite trend within the nutritional group of food advertisements. Changes in the direction of greater accuracy in food advertisements were seen after 1930, and particularly after 1940. It might be conjectured that food advertisements of the 1950's will be largely non-nutritional or nutritional specific advertisements with further gains made in the direction of greater accuracy.

The Relationship of Vitamin B_6 to Protein Metabolism During Pregnancy in the Rat, MARGARET L. ROSS, *Pennsylvania State University.*

The effects on both the maternal organism and the offspring of depletion of maternal vitamin B_6 stores prior to mating, and of varying levels of pyridoxine in the diet during gestation, were investigated.

Good reproductive performance was observed only in non-depleted animals maintained on pyridoxine-containing rations during gestation. Adverse effects of vitamin B_6 depletion prior to pregnancy could not be counteracted by pyridoxine supplementation during pregnancy. Depletion of the vitamin B_6 stores prior to mating and/or pyridoxine deficiency during pregnancy resulted in decreased maternal weight gains and nitrogen retentions, production of undersized young, and increased incidence of resorption.

Changes in maternal serum protein and non-protein nitrogen levels during pregnancy in the rat followed a trend similar to that reported for the pregnant human. Pyridoxine deficiency brought about alterations in these blood constituents which resemble those reported in complications of human pregnancy.

Disturbances in the intermediary metabolism of protein due to interference with vitamin B_6-dependent enzyme systems, in addition to the effects produced by pyridoxine deficiency on the hormonal interrelationships normally operative during pregnancy, are discussed as possible explanations for the relatively poor reproductive performance of the pyridoxine-deprived animals.

The data obtained indicate that pyridoxine in the diet before mating is as important as pyridoxine in the diet during gestation. This gives further support to the hypothesis that the condition of the maternal organism prior to the inception of pregnancy plays a critical role in the course of pregnancy and its outcome.

Changes in Weight and Composition of Organs During the Reproductive Cycle in Rats, HELEN J. SOUDERS, *University of California.*

Observations of 11 organ and gland weights in 40 parturient, 38 lactating, 26 resting, and 79 unmated female rats were statistically analyzed for significant changes.

One day after parturition there was an increase in absolute and relative weights of the liver and uterus and absolute weight of the ovaries compared to unmated littermate controls. Adrenal and thymus weights were decreased relative to body weight.

After three weeks' lactation the pregnancy changes in liver, adrenal, and thymus weights persisted. In addition, there was an increase in the relative and absolute weights of the heart, kidneys, and empty washed intestine.

All organ and gland weights had returned to the control levels except the heart 21 days after weaning a litter of 7 to 8.

Increases in weight of liver, heart, kidneys, and intestine were not accompanied by appreciable changes in moisture, fat, or total nitrogen.

The effects of injections of purified hormones on the weight and composition of liver, heart, kidneys, and intestine were studied. It was found that treatment by a combination of hormones would produce changes similar to those observed in rats at the end of lactation, with the exception that intestine weights were not increased.

The effective treatment was as follows: 7 daily injections of a combination of 1 μg estrone, 4 mg progesterone, 0.2 mg somatotrophin, and 2 mg mammotrophin; followed by 4 daily injections of 5 mg mammotrophin, 0.5 mg somatotrophin, 1.25 mg 17-hydroxycorticosterone, and 10 μg thyroxine. This combination of hormonal injections was effective in either doubly operated (hypophysectomized, ovariectomized) or triply operated, (hypophysectomized, ovariectomized, adrenalectomized) virginal test rats.

Institution Administration

Industrial Food Service Management, JOAN JONES COLEMAN, *University of Chicago.*

This study was limited to the managerial content of food service for employees in business enterprises. It included a detailed scrutiny of data from other investigations and an intensive investigation of 15 business enterprises which provided some daily food service for their employees at the place of their employment. The primary purpose of this investigation was an examination of the larger issues of managerial policy which have prompted management to assume responsibility for a peripheral service—food service—together with the discernible consequences.

Other investigations showed that most of the claims of benefits accruing from food service for employees

appeared to be one of the following: industrial food service promoted improved worker morale; industrial food service improved the health of the worker; the employer, as a result of this improved health and morale, gained through increased productivity of his workers. However, little concrete evidence of the value of food service was presented.

Management seldom could differentiate the contribution of food service from among the many factors which affected both health and morale. Since managements frequently could not present tangible benefits from food service, they substantiated their opinion that this service was beneficial to the company by saying that the number served was an indication of the contribution of food service to health and morale.

By accepting food service for employees as peripheral to activities which sustain the existence of the company, managerial attitudes toward benefits and costs appeared to be one of the following:

1. Management's best analysis of benefits and costs indicated that the firm realized some decided benefits from food service by having employees remain on the premises which resulted in their spending an increased proportion of time at work; and that these benefits were sufficient to justify the firm in providing such a service.
2. The firm realized some tangible advantages by making it possible to secure an adequate working force of the quality needed when the firm was isolated or when there was lack of sufficient restaurants. The chief concern in these firms was to provide this service as efficiently as possible.
3. The firm took the attitude that intangible benefits also were derived which justified the firm in underwriting considerable outlays of capital and expenditures, and in not inquiring too carefully into the exact justification and accounting of food service.
4. Another managerial attitude was that the firm was forced to offer the service in order to maintain its competitive position or its standing as an employer.

The intensive investigation and a study of surveys reported by others have shown the extensive employment of food service. The almost universal opinion expressed by management was that provision of food service will result in benefits to industry through its contribution to health and morale.

Textiles and Clothing

Laboratory and Wear Evaluations of the Characteristics of Hand and Durability of Rayons Having Three Different Finishes, BETHEL M. CASTER, *Texas State College for Women.*

This dissertation described a study of certain characteristics important in rayon apparel. In Part I, tests were conducted on rayon fabric treated respectively with Avcoset, methacrol, and urea formaldehyde finishes in order to find their responses to laboratory tests for laundering, abrasion, wrinkle recovery, ironing at a series of specified temperatures, and draping and needle cutting during power sewing. The following conclusions were drawn:

1. Avcoset-finished fabric proved superior in abrasion tests.
2. In laundering experimentation, methacrol-finished fabric had poorest wrinkle-recovery.
3. Variation of ironing temperatures had little effect on wrinkle-recovery of all fabrics.
4. In draping tests, Avcoset-finished fabric initially ranked best in drape for dress construction, with Avcoset- and urea formaldehyde-finished fabrics giving comparable performance throughout the laundering-ironing procedures. Methacrol-finished fabric progressively lost body during laundering and finally was extremely limp.

Part II was a comparative wearing study of blouses constructed from the same types of finished rayon. Blouses were constructed by standardized procedures. Dry cleaning, commercial laundering, home laundering in an automatic washer, and hand laundering were employed in cleansing the garments, using a series of 20 identical cleansings in each case. Wearing-time between launderings was standardized. Measurements were recorded after specified cleansings. Conclusions were:

1. In cutting, urea formaldehyde-finished fabric presented fewest difficulties.
2. Avcoset-finished fabric presented fewest construction difficulties.
3. Finally, numerical count of reported damages indicated Avcoset-finished fabric had fewest signs of wear. Urea formaldehyde-finished fabric ranked second.
4. In dimensional stability, the fabrics ranked as follows: Avcoset (least change), urea formaldehyde, methacrol (greatest change).

A Study of Some of the Factors That Contribute to Satisfactions and Dissatisfactions in the Clothing of Ninety-two Urban Low-Income Families, KATHARINE BURNETTE HALL, *Pennsylvania State University.*

The purpose of this study was to discover some of the factors that contribute to satisfactions and dissatisfactions with the clothing of a group of urban low-income families.

The following information was obtained from 92 families by questionnaire-interview technique: certain socioeconomic background factors; the kind and amount of clothing that was owned by each family member; the purposes for which family members used their clothing; feelings of satisfaction and dissatisfaction with the clothing family members owned as stated verbally by one family member—the wife; and whether or not certain selected factors of family living had any bearing on the kind and amount of clothing the family members owned and their feelings of satisfaction and dissatisfaction with clothing. Specific characteristics

of certain clothing items that were especially liked or disliked by the interviewee were examined to throw light on kinds of reasons for satisfaction and dissatisfaction with clothing, and to investigate whether or not generalized answers relating to satisfaction would be borne out in specific answers regarding satisfaction with clothing.

When the amount of clothing owned was tabulated, a non-equivalence of the items of clothing making up the wardrobes of the men and women was seen. A weighting system was developed for this study which was based on the actual number of garments owned by these families and was related to the prevailing price lines in the stores of the city in which these 92 families lived.

Several factors, when isolated, were found to be related to the amount of clothes owned by the family members. Many of these same factors were found to have bearing on the satisfaction score of the husband and wife. These factors were: age, education, number of children in the family, social activities, and whether or not the wife worked outside the home and the kind of work in which she was engaged.

Studies of the Soil Removal Efficiency of Formulations of Soap and Sodium Metasilicate Employing an Impact-type Mechanical Detergency Tester, GRAHAM ELIZABETH HARD, *Texas State College for Women.*

The research described in this report deals with the effect on removal of soil from a standard soil fabric of various concentrations of sodium hydroxide, sodium carbonate, trisodium phosphate, sodium metasilicate, neutral low-titer soap, neutral high-titer soap, and of neutral high-titer soap combined with sodium metasilicate.

Detergent concentration was based on total sodium oxide content in every instance. The concentrations of the soaps, alkalis, and soap and alkali combinations investigated were within the normal use range employed in commercial, institutional, and home laundering. The temperatures used in the study were those generally accepted for use in commercial launderies for white cotton fabrics.

The objectives of this research were to determine the optimum operating procedure for the Deter-Meter detergency tester; to investigate the soil removal characteristics of the soaps, alkaline builders, and soap-alkali formulations in varying ratios.

The concentrations of detergents in this study were expressed as total sodium oxide content of the solutions. Titrations were made on 50-ml samples taken from each run, using standardized 0.2 normal sulfuric acid and methyl orange indicator.

Soil removal values were determined from electronic measurements of the reflectance of the standard soil pieces before and after test in the Deter-Meter detergency tester. Reflectance readings were obtained using a Hunter Multi-purpose Reflectometer.

It is to be inferred from the data that two basic functions are extant. First, the two soaps produce relationships between soil removal and total sodium oxide content which delineate growth curves characterized by abruptly rising soil removal at relatively low concentrations. Such curves permit the selection of an optimum concentration, one in which good detergency is obtained at a point beyond which further additions of compound produce no notable increases in soil removal. Secondly, in the case of each of the four alkaline agents, there is no marked character revealed in the shape of the curves, and no clearly established optimum is apparent.

Maximum soil removal for all ratios of high-titer soap and sodium metasilicate, except for the 5/95 total sodium oxide ratio, fell within the range of 37 to 41 per cent. Soil removal for the 5/95 sodium oxide ratio of soap to sodium metasilicate rose gradually from zero to a maximum in the range of 0.03 to 0.055 per cent total sodium oxide concentration. Maximum soil removal for the 5/95 sodium oxide ratio of soap to sodium metasilicate was about 33 per cent, nearly 5 per cent lower than that found for ratios with higher soap content.

An Analysis of the Silk Industry, ROSE W. PADGETT, *Purdue University.*

Despite considerable opinion to the contrary, silk continues to dominate in luxury items in apparel and even in men's wear. Both the inherent qualities and the prestige of silk have always placed it in an advantageous position for use in fiber blends. Silk lifts the lower priced man-made fibers into a more desirable, higher priced apparel group, and at the same time silk blends are placed within the reach of the lower income groups. The global promotion of silk along with the steady increase in population and higher standards of living in both the developed and newly developed countries, provides added potential silk consumers in a world where demand for silk is high and where silk stocks are low. The use of fiber blends, both natural and man-made, does much to satisfy this increasing consumer demand for the luxury of silk.

Innovations in all phases of sericulture techniques are now resulting in even better quality and a wider variety of silk fibers and fabrics. The call for domestic silk on the home market in the major sericultural areas of the world has markedly reduced the flow of raw silk in international trade. The global use of wild silks, native fabricated silks, and silk blends has increased similarly in postwar years. Increased use of wild silk cocoons, at present going to waste, may well materialize as the result of innovations in the gathering and processing of these cocoons.

Statistics indicate that surplus labor on the home market may be used to fabricate desired native silks for the world market. Undeveloped countries such as those in the East Indies might do well to pattern their new textile industries after the Japanese sericulture

design, not only in improved mulberry cultivation, seed, collective hatching, feeding, and cocoon sales but also in mechanical reeling, testing techniques, weaving, finishing, marketing, and silk promotion. Above all, raw silk imports from nearby countries should be used for weaving.

World raw silk production figures for 1953 show Japan as prime producer with 15,043.3 metric tons, China second with 4,200.0 metric tons, Russia third with 1,900.0 metric tons, Italy fourth with 1,478.5 metric tons, and India fifth with 843.0 metric tons. Current percentage share of the various regions of the world total for the year 1953 runs as follows: Far East, first with 78.4 per cent; followed by Free Europe and Turkey, second with 8.1 per cent; and Russia and European satellites a close third with 7.9 per cent of the world raw silk production. World production of silk is about one per cent of the world's soft fiber production.

Since Japan's silk contribution accounts for 60 per cent of the world output, the present-day success of world sericulture is largely attributed to the development of sericulture in Japan. Governments are working hard to foster sericulture in their own countries patterned after the Japanese five-year plan. The increased yields and new technology in the silk reeling section tends to account for most of the silk expansion achieved during the last five years.

It appears that man-made fibers will be used in several of silk's former uses, but it also seems probable that silk will hold its place in the world market for textiles of the highest quality.

A Study of the Physical Properties of Textiles and of Construction Techniques Used in Converting Them into Women's Garments, MARTHA GENE SHELDEN, *Texas State College for Women.*

This research problem has dealt with the design and application of tests for dress fabrics which would enable the dress manufacturer to know the probable performance of fabrics during use and to choose the best techniques to be applied to the textiles in converting them into wearing apparel. The study was concerned with 16 fabrics representing a range of hand and of types of materials of different fiber content.

The objectives of the study were: (1) to test the performance of selected construction techniques and certain fabric characteristics in regard to draping, blocking, and pleat retention, (2) to score ratings given by a panel of experts, (3) to compare ratings given by the experts with ratings given by laboratory findings, and (4) to recommend a simplified battery of tests for evaluating fabrics for the manufacturer.

Assemblies prepared for each of the fabrics included: seams with different finishes and widths, hem finishes, buttonholes, and scallops showing different treatments to simulate seams enclosed in collars and facings. The testing was done in the original, with six fabrics after one dry cleaning and a series of hand launderings, and with ten fabrics treated as the six above and also after the same series had been laundered commercially.

The fabrics were evaluated by designers from well-known houses which manufacture this grade of garment. This subjective evaluation was used for comparison with laboratory evaluation. The designers were asked to do their evaluation in the light of their commercial experience. The evaluation by the two means was very near only in two items—buttonholes and blocking properties.

This investigation has found that many fabric properties and many construction techniques cannot be evaluated properly by the subjective means. The author believes that a testing program can be developed which will result in greater satisfaction both to the manufacturer and to the consumer; that certain construction techniques and certain physical properties should be evaluated in a testing program.

Treatment of Cotton with Inorganic and Organometallic Compounds for the Improvement of Cotton Textiles for Military and Civilian Uses—Review of Literature and Standardization of Test Procedures, GEORGIA ELLEN WRIGHT, *Texas State College for Women.*

A long-time research project has been inaugurated relevant to the improvement of specific characteristics of cotton for military and civilian uses. Although the effects of inorganic and organometallic compounds as treatment reagents for cotton previously have been studied by numerous investigators, the subject never has been approached systematically as to the respective groups of elements in the periodic table.

This study, the first in a series, was designed to ascertain the work of other investigators through a comprehensive review of the scientific literature, to standardize techniques for measuring certain of the properties which may be improved, and to make a preliminary contribution toward finding the mechanisms by which certain compounds improve the functional characteristics of cotton fabrics.

Foreign publications and confidential reports compiled by the government incident to World War II were included in the review of literature which constituted Part I of the dissertation. Inorganic and organometallic compounds, their method of application, the functional properties improved, and the tests for evaluation were noted.

The major objective of Part II of this investigation was to evaluate a series of test procedures. Cotton muslin was treated with six inorganic compounds, and the following tests were made: retention during laundering and leaching, tensile strength, bursting strength, tear strength, abrasion resistance, water absorption, thermal stability, stability to aging and light, water repellency, flame resistance, outdoor weathering stability, and rot and mildew resistance.

Since these tests were reproducible, they should provide the instrumentation for the evaluation of treated cottons as to the properties altered by the compounds applied and to the chemico-physical mechanism involved in the union of the compound to the cellulose molecular complex.

Use the hotel reservation blank on page 219 for annual meeting hotel reservations

Feeding Your Baby and Child. By BENJAMIN SPOCK, MD, and MIRIAM E. LOWENBERG. New York: Duell, Sloan and Pearce; Boston and Toronto: Little, Brown and Company, 1955, 226 pp., $3.75.

This popular book, authored by a pediatrician and a nutritionist both of whom are very well qualified on the subject of feeding babies and children, shows the excellent results that can be achieved by such a team. The style is a very interesting and clear one in which the reader feels almost face to face with the friendly authors who treat the subject in a manner that creates a confidence in the writers. The subject has a good balance of theory and practical advice. There are enough charts to make the subject better understood and more convincing to the mother. A chapter on recipes and one on menus adds a great deal to the book and should be most welcome to mothers who are faced with feeding youngsters in a family. The subject is well covered and foresees practically all problems a mother is likely to face in the feeding of her young children. This is an excellent book to recommend to prospective mothers or mothers of young children. This reviewer, the mother of two young children both of whom were nursed, feels that a more intensive treatment of the section on breast feeding might have added to the value of the book.—ANDROMACHE SISMANIDIS, *Washington, D. C.*

Homemaking for Teen-Agers. Revised Edition. By IRENE E. MCDERMOTT and FLORENCE W. NICHOLAS. Peoria, Illinois: Charles A. Bennett Co., Inc., Publishers, 1955, 492 pp., $3.48.

This book, designed for young teen-age students, is a revision of the earlier edition, which appeared in 1951. It is organized in ten units, based on the activities, interests, and problems of this particular age group. Material was obtained from 2300 questionnaires sent out by the authors and tested by various teachers in five pilot groups before the book was written.

Much of the content is substantially the same as in the previous edition, but certain problems in sewing have been replaced by others that are more appealing to the students.

The preface has been entirely rewritten, and the book has been enhanced by colored plates. Additional pictures have been added, and some of those used in the previous edition have been enlarged, adding materially to the appearance of an already attractive book. Filmstrips, from the series prepared by the authors, have been added to the lists at the end of the units.

The newer edition should be both interesting and appealing to the beginner in home economics.—RUTH HENDERSON, *University of Wisconsin.*

Textile Fabrics and Their Selection. Fourth edition. By ISABEL B. WINGATE. Edgewood Cliffs, N. J.: Prentice-Hall, Inc., 1955, 703 pp., $8.65.

In this fourth edition of a well-known book the reorganization and revision of subject matter recognize the technological changes in textiles, the growth of the synthetic fiber industry, the new finishing processes, and the innumerable fiber blends found on the market.

The purpose of the book is a worthy one—"to present the facts to help the consumer get satisfactory use from textiles." Also it offers selling points to the retail salesman. The presentation is semitechnical in character, readable, and informative, with photographs and drawings throughout the book.

The first part, formerly on Fabric Construction and Customer Demand, has become Fabric Construction and Buying Motives. Subject matter on the textile fibers, yarns, and weaves has been expanded and related to end use. Chapters on rayon and acetate, on the new synthetic fibers, and on care of textile fabrics have been added.

The second part, on Selection of Appropriate Fabrics, has the same title and chapter headings as in the last edition, though the subject matter has been brought up to date. The sections of men's and boys' wear, domestics, and rugs are especially valuable.

While there is much information on sheets and some repetition when they are discussed in the chapter on selection of domestics, there is no comparison of the American Standards Association Standard and American Home Economics Association Consumer Standard for that commodity; nor is there a clear distinction between muslin and percale sheets and the advantages and disadvantages in the use of each kind.

There is so much that is valuable about the book that one hesitates to comment on what seems to this reviewer a few inaccuracies and some unnecessary repetition.—HENRIETTA M. THOMPSON, *University of Alabama.*

How to Decorate and Light Your Home. By E. W. COMMERY and C. EUGENE STEPHENSON. New York: Coward-McCann, Inc., 1955, 256 pp., $6.75.

This book would be helpful to all homemakers regardless of age or income. The importance of

Do modern girls ask as many questions about menstruation?

Girls today ask even more questions than their mothers did. Partly because of a healthier, more normal attitude towards personal hygiene. And partly because of the enormous growth in popularity of internal sanitary protection over the past twenty years.

That's why a teaching guide that covers every aspect of menstruation is particularly valuable. "How Times Have Changed" is such a manual. It contains anatomical charts. Doctors' papers. Ancient superstitions. And it includes, as well, a discussion of internal sanitary protection.

Also available without charge is a students' leaflet: "It's Natural, It's Normal." Send for both today. Even if you are already covering the subject of menstruation in your classes, this material represents a worthwhile addition to your data.

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harmony and lighting in decorating and furnishing of homes is not understood by many homemakers, and the value of this book is to demonstrate to such people, who feel an inability to cope with decorating, that with planning and forethought an attractive home for all members of the family can be achieved. Each member of the family must be assured of both privacy and family living.

The chapters on color are not new in theory but readily understood by even new students of art and decorating.

The planning of furniture grouping, window treatments, and especially lighting, is emphasized.

Mr. Commery is well known in the field of lighting and has illustrated many new and usable ideas. He points out that plenty of indoor and outdoor electrical fixtures are necessary. Now, with outdoor meals so popular, there must be provision made for rotisseries, coffee makers, and other electrical appliances, plus adequate lighting for general illumination and for unusual garden effects.

At the end of the book are "recipes" for correct lighting for all rooms and for special jobs. The appendix includes color definitions and reflectance values and a lumen data chart for incandescent and flourescent lamps and suggested uses for each type.

This book can be recommended for use in schools and colleges and as a reference book for all homemakers.—Lois Holt, *Douglass College.*

Mary Meade's Kitchen Companion. By Ruth Ellen Church. New York: The Bobbs-Merrill Company, Inc., 1955, 357 pp., $3.95.

The Social Welfare Forum, 1955. *Official Proceedings, 82d Annual Forum, National Conference of Social Work, San Francisco, California, May 29-June 3, 1955.* New York: Columbia University Press, 265 pp., $5.

Study Abroad. Volume VII, 1955-56. By UNESCO. Paris, France: UNESCO [available in United States from Columbia University Press, New York City], 1955, 703 pp., paper bound, $2.

International handbook of fellowships, scholarships, educational exchange.

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APPLICATION
FOR HOTEL ACCOMMODATIONS

47th ANNUAL MEETING

AMERICAN HOME ECONOMICS ASSOCIATION

WASHINGTON, D. C.

June 26–29, 1956

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(List of Available Hotels on Back of this Page)

1. Reservation requests must be sent to the AHEA HOUSING BUREAU, Washington Tourist & Convention Bureau, 1616 K Street, N. W., Washington, D. C.
2. Please make all changes and cancellations through HOUSING BUREAU.
3. Room assignments will be made in order received.
4. Single rooms are very limited. Your chances of securing accommodations at the hotel of your choice will be much better if your request calls for rooms to be occupied by two or more persons.
5. Be sure to list definite arrival and departure date and time.
6. Be sure to list all names of occupants of rooms.

AHEA HOUSING BUREAU
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Washington, D. C.

Please check if you are attending a pre-convention session ☐

Specify name of group (HEIB or EXTENSION) .....

Please reserve hotel accommodations as follows:

1. **Preferred Hotels:**

First Choice ..... Fourth Choice .....
Second Choice ..... Fifth Choice .....
Third Choice ..... Sixth Choice .....

2. **Please specify the number and types of rooms desired:**

..... Single room(s) with bath for ..... person(s). Rate $ ..... to $ ..... per room.
..... Twin bedroom(s) with bath for ..... person(s). Rate $ ..... to $ ..... per room.
..... Double bedroom(s) ..... persons. Rate $ ..... to $ ..... per room.
..... Parlor bedroom suite ..... person(s). Rate $ .....

3. **Date of Arrival** ..... ; morning ..... or afternoon .....
(Reservations will be held **only** until 6:00 p. m. unless the hotel is notified otherwise.) (If, after making reservations, you find it impossible to attend please notify the Housing Bureau promptly.)
4. **Date of Departure** ..... Approximate hour .....
5. **If accommodations are to be used by more than one person please list names below:**

NAME	STREET ADDRESS	CITY	STATE

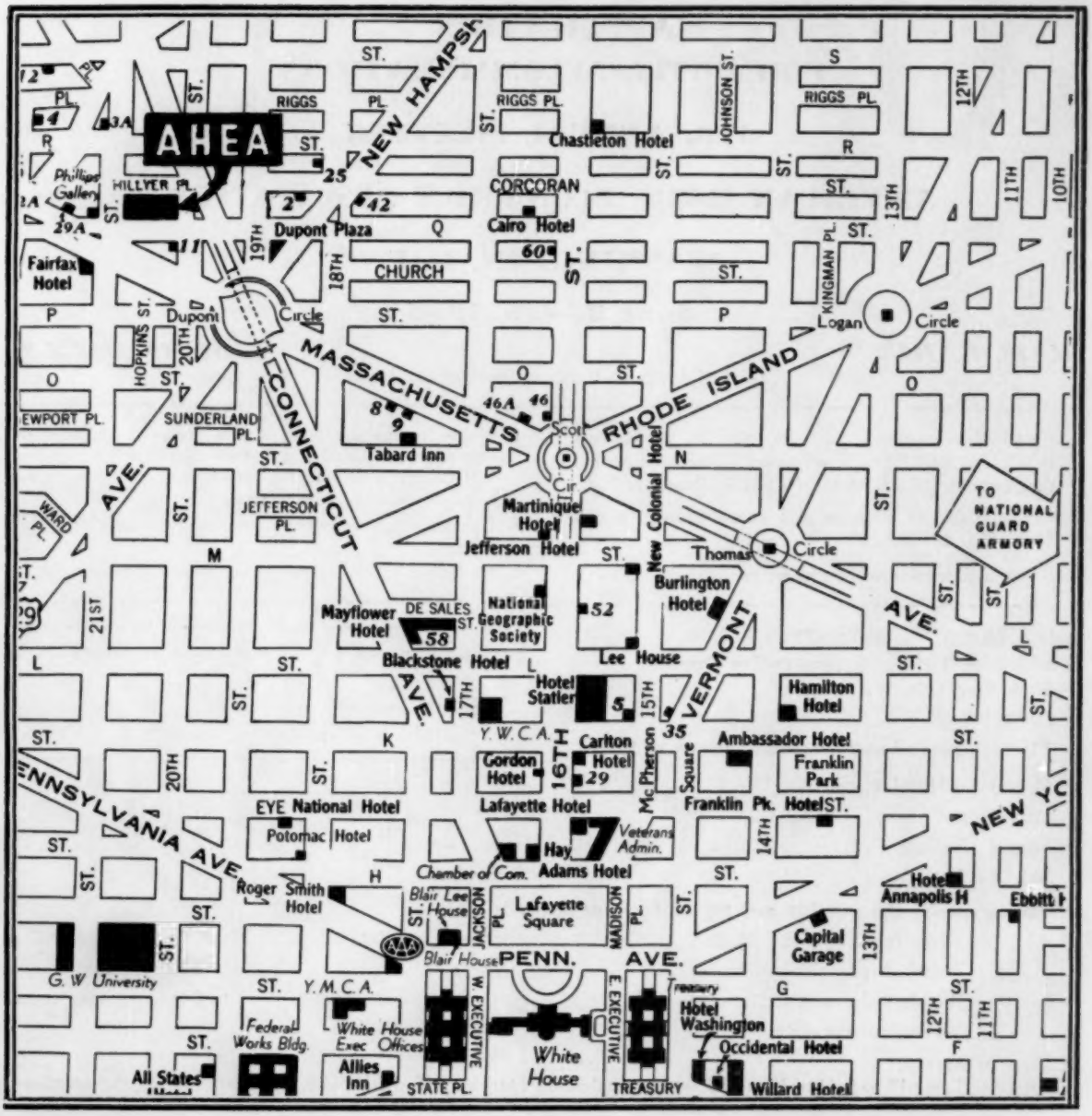
Signed: .....

6. **BE SURE TO SIGN YOUR NAME** ➡

..... (Street Address)

..... (City and State)

(OVER)



MAP OF DOWNTOWN WASHINGTON SHOWING LOCATION OF THE COOPERATING HOTELS WHICH ARE LISTED BELOW

		SINGLE	DOUBLE BED	TWIN-BEDS	SUITES
AMBASSADOR	14th and K St., N.W.	$ 5.50– 9.50	$ 8.50–11.00	$ 9.50–13.00	
DUPONT PLAZA	Dupont Circle	8.50– 9.50	11.50–12.50	11.50–13.50	$18.00–24.50
LAFAYETTE	16th and Eye St., N.W.	6.00– 8.00	8.00–11.00	10.00–12.00	14.00–18.00
LEE HOUSE	15th and L St., N.W.	5.00–11.50	8.00–13.00	10.50–15.00	
MANGER HAMILTON	14th and K St., N.W.	5.50– 8.50	9.00–11.50	9.50–11.50	22.00
MANGER HAY ADAMS	16th and H St., N.W.			15.00	
MAYFLOWER	Connecticut Ave., N.W.	8.00–19.00	14.00–20.00	14.50–22.00	24.00–37.00
RALEIGH	12th and Pennsylvania Ave., N.W.	6.00–10.00	9.00–13.00	10.00–15.00	18.00–25.00
ROGER SMITH	18th and Pennsylvania Ave., N.W.	5.00– 8.00	8.00–12.00	9.00–12.00	
SHERATON CARLTON	16th and K St., N.W.			16.00	30.00–34.00
STATLER	16th and K St., N.W.	7.00–17.00	10.50–14.50	11.50–19.50	31.50–38.00
WILLARD	14th and Pennsylvania Ave., N.W.	7.00–11.00	10.00–15.00	11.50–17.00	20.50–33.50

NEWS NOTES

GENERAL

A photograph of **Dean Marie Dye** of the School of Home Economics of Michigan State University, 1948-50 president of the American Home Economics Association, and a copy of the Recognition Scroll presented to her by Omicron Nu during the Society's 1955 Conclave banquet at Michigan State University in June appear in the 1955 Conclave Proceedings Issue of the *Omicron Nu Magazine*.

William H. Danforth, founder and board chairman of the Ralston Purina Company, philanthropist, and an honorary member of the American Home Economics Association, died at his home in St. Louis, Missouri, on Christmas Eve. In making him an honorary member in 1954, AHEA said: "As a Christian layman he has set an example to both men and women in the use of his talents, his means, and his leadership to further the cause of character development and devotion to high values. For almost a quarter of a century through Danforth Fellowships to home economics students our professional ranks have been enriched."

Professor Kate Daum, director of nutrition at the State University of Iowa Hospital since 1926, died at the Hospital on December 31 after several months' illness. Dr. Daum joined the SUI staff as an assistant professor in 1926. She was an instructor in the internal medicine department and in 1941 became an associate professor of theory and practice of medicine. She was appointed a professor in 1953.

In 1947 Dr. Daum received the University's award for distinguished service, and in 1949 the AHEA honored her with the Borden Award for research in nutrition and experimental foods. She was a former president of the American Dietetic Association. Prior to joining the SUI staff, Dr. Daum taught at the Universities of Kansas, Indiana, and Montana, Columbia University, and North Carolina College for Women.

Mary Holtman, former regional home economist for the International Harvester Company, Chicago, on December 15 joined the staff of the National Project in Agricultural Communications, located on the Michigan State University campus, to direct and co-ordinate the Project's activities in the home economics field. At the time of Miss Holtman's appointment Stanley Andres, executive director of NPAC, announced that the Project was about to launch, in co-operation with the major home economics professional groups, a nation-wide program to improve communications in home economics. The following were listed as objectives: Improve and increase opportunities for home economics students to obtain communications training; emphasize career opportunities in home economics; encourage research in home economics communications; and improve the quality of informational materials produced.

INTERNATIONAL

Viola Callahan, former homemaking teacher at Hoxie, Arkansas, has accepted a three-year assignment as director of social activities and teacher of home economics in the American School in Japan, 1985 Kami Meguro, 2 Chome, Meguro-Ku, Tokyo. She reports that 30 nationalities are represented in the School's enrollment.

Helen Cannon of the University of Colorado has been at the University of Peshawar, Peshawar, Pakistan, since September 1, 1955 on a two-year International Cooperation Administration assignment to help develop a home economics program at the University.

Marie M. Di Giacomo, who recently taught foods and nutrition in the Abraham Lincoln High School in Philadelphia, Pennsylvania, wrote AHEA headquarters in November from the Youth Training Centre, Anomabu, Gold Coast, that for the next 18 months she expected to be with the Department of Social Welfare and Community Development of the Gold Coast, teaching Mass Education officers and assistants, who, in turn, will work with the women in the villages. Miss Di Giacomo's present work is made possible by a Haverford College fellowship, and her program is financed by the Ford Foundation. She reports that she is covering all areas of home economics in her teaching but stressing foods and nutrition and child care.

STATE ACTIVITIES

ALABAMA. Marion Walker Spidle, dean of the School of Home Economics at Alabama Polytechnic Institute, Auburn, has been appointed head also of the department of home economics research at the API Agricultural Experiment Station.

A new area has been added to the **Experiment Station's research in home economics**—family life—under the direction of Ruth Albrecht. Mildred Van de Mark and Betty Prather conduct research in nutrition in the foods preparation and nutrition section, and Kathryn Philson is doing full-time research in family housing and household equipment.

The Silver Anniversary of the founding of the School of Home Economics at the University of Alabama is being celebrated this year—the 45th year of the teaching of classes in home economics at the University. Special events, a symposium, and special publications throughout the year are planned as part of this celebration.

The first of a weekly series of home economics programs over the statewide educational TV network was presented by the home economics faculty of the University on November 3.

Dr. William Lampard, formerly of the University of Iowa Child Welfare Research Station, is the new head of the department of child development and family life at the University of Alabama.

Patricia Hankley, who received her MS from the University of Tennessee, is an instructor in the department of child development and family life at the University of Alabama.

Catherine Turner, recently of Kansas State College, is assistant professor in foods and nutrition at the University.

Dr. Alfred Macormac, formerly with the U.S. Department of Agriculture, has joined the University staff to do research in clothing and textiles.

ALASKA. Members of the mental health team, Oscar E. Hubbard, MD, psychiatrist, and James C. Parsons, psychologist, have addressed the classes in child development and marriage at the University of Alaska. The team, a section of the Alaska Department of Health, visits Fairbanks every fifth week.

Special guests at the fall Open House of the home economics department of the University of Alaska on November 17 were the 55 elected delegates from all parts of Alaska convened on the campus to write a State Constitution for Alaska. The Student Union building, now called Constitution Hall, was completed in time to provide an auditorium and committee rooms for this historic assemblage.

The All-University Open House on December 9 attracted many visitors from nearby Fairbanks. The home economics department featured demonstrations and exhibits under the supervision of Mrs. Lola Tilly, Vena Clark, and Mary Morlan. The Extension Service showed the 16-mm film "Yarn about a Kitchen" and building plans for Alaskan homes and farm buildings.

Mrs. Elizabeth Tyler of Elberton, Georgia, was appointed home demonstration agent in the Fairbanks office on December 1.

ARKANSAS. Selma F. Lippeatt, an assistant state supervisor of home economics for the State Department of Education for the past 12 years, has accepted a temporary appointment as assistant chief of the Home Economics Education Branch, Office of Education, Department of Health, Education, and Welfare in Washington, D.C.

CALIFORNIA. Focusing on the state program of work for recruitment, the December meeting of the *Northern Section* of the **California Home Economics Association** was keyed to the theme "Future Unlimited." A skit, "Where Can You Go with a Home Economics Degree," and discussion groups with experts in their fields presented information to pupils from 45 high schools in this district.

Practical testing of college theories is being done in their homes by two young brides who hold scholarships granted by the *Bay Section* of the Association at San Francisco State College and are training to be teachers. The third scholarship holder is studying at San Jose State College, where she is president of the home economics club.

"FHA—A Beacon Toward Success" was the theme of the ninth annual meeting of the California Future Homemakers of America in Asilomar. Taking stock of past achievements, appraising the way ahead, and applying the past lessons to future enterprises were given consideration. Honorary memberships were presented to Mrs. Elmer Martin of Chico, past state mother; Mary Catherine Starr, head of home economics at Sacramento State College; and Mrs. Fern Vierira, Rio Vista teacher.

A new Home Economics Building and Home Management Residence are being constructed at San Diego State College and will be ready for occupancy next fall.

Kay Welch, dean of women at Chapman College, Orange, reports that a new home economics department has been opened at the College which it is hoped will become a major department soon.

Velma Bradfield, formerly of Orange High School, is now with the California State Department of Education and located at the Berkeley campus of the University of California.

COLORADO. Elizabeth Dyar, dean of the School of Home Economics at Colorado A & M College, and **Clara Hatton,** head of the art department, have returned from a year's sabbatical leave.

New staff members at Colorado A & M College this year include **Mrs. Billie Caskey** in home management and household equipment, **May Frances Cochrane** and **Mrs. Mildred Lynch** in textiles and clothing, **Hazel Crain** in home economics education, **Frances Miller** in occupational therapy, **Mrs. Inez Harrill** in foods and nutrition, and **Mrs. Marie Rennels** in child development.

Visiting summer school lecturers at the University of Colorado will be Maude Williamson, formerly professor at Colorado A & M College, in the area of home economics education, the first term; B. Eleanor Johnson, formerly of the University of Arizona, in the area of the family and family economics, second term; and Sara Meador of Oklahoma A & M College, in the area of textiles and clothing, both terms.

Mrs. Hazel Fehlmann, one of two delegates of the American Dietetic Association to Yucca Flats last spring to participate in the mass feeding demonstration for Civil Defense workers following the test shot of a nuclear weapon, has reported this experience to various groups in Colorado and from neighboring states.

FLORIDA. Fourteen county and assistant home demonstration agents were recently appointed in Florida. The agents are: **Virginia Holland,** De Soto County; **Mrs. Wylma B. White,** Hamilton County's first agent; **Mrs. Helen B. Hunerwadel,** Lafayette County's first agent; **Mrs. Gertrude P. Harrell,** Martin County; **Mary Todd,** Palm Beach County; **Betty Duckett,** Walton County; and **Mrs. Dorcas Lambe Payne,** Washington County.

Assistant agents are: **Mrs. Erma L. Butcher,** Dade County; **Mrs. Josephine M. Cameron** and **Demetra Tarrant,** Duval County; **Mrs. Mamie A. Bassett,** Hillsborough County; **Wilma Reichert,** Manatee County; **Mrs. Charlotte Drane,** Marion County; and **Jo Ann Tilley,** Pinellas County.

ILLINOIS. Results of 18 years' research are presented in "Spending and Saving Patterns of Illinois Farm Families from 1933 to 1950" by Ruth Crawford Freeman, University of Illinois assistant professor of family economics. This booklet shows the long-time trends in farm families' financial spending and indicates how they adjusted to the changing economic situation during those years. It also gives patterns by which farm families can evaluate their spending and saving. Mrs. Freeman's "A Guide in Weighing Choices in Family Financial Planning" is being used widely in the farm and home development program in Illinois. She compiled the information for this publication from the 1954 accounts of 132 Illinois farm families.

A pilot study on determining the dimensions of space needed around household equipment and furnishings for their effective use and care was recently finished by Helen E. McCullough, University of Illinois assistant professor of housing research. Her work has attracted the attention of builders and designers across the country who realize the need for accurate measurements of household equipment and activities. The clothing and housing branch of the Agricultural Research Administration of the U.S. Department of Agriculture, Pennsylvania State University, Alabama Polytechnic Institute, Washington State College, and the University of Illinois have recently initiated a comprehensive study in this area. In Illinois, 30 homemakers of various heights and weights from Champaign-Urbana are participating in Miss McCullough's portion of the study by making beds, dusting, cooking, and performing other home activities under laboratory-controlled conditions.

Carmen R. Camara, a member of the faculty of the University of San Carlos, Cebu City, Philippines, is working toward a master's degree in food and nutrition at the Illinois Institute of Technology.

"Feeding the Supersonic Pilot" was the subject of a slide-illustrated lecture by Edythe Robertson, chief of the feeding service section of the Department of the Air Force, at the monthly dinner meeting of the Chicago Home Economists in Business on January 12 at the Chicago Bar Association.

IOWA. New research at Iowa State College includes: (1) A study of family practices in the **selection and use of garments for boys** 9 and 10 years of age as part of the North Central Regional Cooperative Project in textiles and clothing. Information regarding characteristics of fabric, style, comfort, construction, price and desirability of jeans, slacks, and woven and knitted shirts will be assembled to aid in better family buymanship. (2) A master project in which factors related to the **uses made of resources by rural farm families** of Iowa will be studied. Material, human, and community resources and factors like the following will be identified: (a) family characteristics (such as family cycle, tenure, socioeconomic status) and (b) attitudes and practices in respect to goals for family living and decision-making in the use of resources. (3) Since there is considerable professional controversy about the **influence of the mother figure** during the early months of a child's life, it seemed important to determine whether infants who have been in home management houses and subjected to multiple mothering have been adversely affected by the experiences. Their development and adjustment will be followed over the years and compared with those of a group of children now receiving foster home care and with another group living in their natural family home.

Research in nutrition concerned with cholesterol in blood and tissues following ingestion and intravenous injections is being continued by the department of home economics at the State University of Iowa.

Studies in nutrition education which purport to appraise methods of teaching also are in progress at the University. Data collected on a three-year study are currently being studied to determine effects and dominant characteristics of nutrition education programs developed by individual teachers. As a whole, their programs have caused improvement in food habits. They have also yielded desirable outcomes in both nutrition information test scores and reading scores.

Just Between Us...

from Martha Logan
Home Economist
Research Laboratories, Swift & Company, Chicago, Ill.

New Bacon Bows In

... can you believe this? Bacon was once known as "sawmill chicken" because it was served almost every meal in the early lumber camps and very seldom anywhere else.

Then, however, the light dawned and all America loved bacon for breakfast. Later it became almost as popular for lunch and dinner too. Of course, bacon gets better all the time! And we thought you would be interested in the newest kind. Swift's Premium Bacon now comes, not only in thin and medium slices, but in *thick* slices which many people prefer. It's packed in a window-carton holding two pounds (no rind included) and *we* think it's the best yet.

Easter Bunnies - Free

... we have a family of the most personable bunnies you've seen in quite a while, ready to garnish your Easter platter! They're in color and, as you can see from the illustration, they are fastened to hard-cooked eggs which have been shelled and tinted with edible coloring to soft pastels. The "buttons" are whole cloves. Send for your bunnies early. Or, if your students would like a bunny family, they are available wherever Swift's Premium Hams are sold.

A Good Trick

... our gelatin Easter eggs are so pretty and so different we've been asked for the recipe thousands of times. Thought you might like it too, so if you don't have it, here 'tis. Make an opening about the size of a penny in one end of eggshell. Pour eggs in a bowl and save to use as scrambled eggs. Wash shells in cold water and drain. Soak 1 T. plain gelatin in ½ c. cold water for five minutes. Dissolve in 1 c. boiling water. Add ½ t. salt, ¼ c. sugar, ¼ c. vinegar, ½ t. onion salt, ¼ c. each of chopped pimiento, green pepper and sweet pickle, and ½ c. finely chopped cabbage.

Divide mixture into three parts. Color one red, one green and one yellow, with food coloring. Fill empty eggshells. Put filled shells back in carton and chill overnight. Serve, unpeeled, in nest of parsley or cress.

The Last Word ... ever hear this Famous Quote? "I've been rich and I've been poor and believe me, rich is better!" See you in April.

Swift
To Serve Your Family Better

My best, *Martha Logan*
for Swift & Company

KANSAS. The Home Economics Association of Greater Kansas City has diversification of officers: President Juanita Luthi is a HEIB; Vice-President Pearlynn Lemmer is a teacher; Treasurer Faye Akright is a homemaker; and Secretary Louise Brady is a dietitian. The homemakers group took charge of the Christmas meeting in the Administration Building Lounge of the University of Kansas City; the dietitians provided the program for the February meeting at the University of Kansas Medical Center; and the teachers are arranging for the March meeting in the homemaking department of the new Van Horn School.

Mrs. Nell Nichols, formerly of *Woman's Home Companion* and now free-lancing, was the speaker at the February meeting of the Wichita HEIB's. Guests were members of the Sedgwick County Home Economics Association and the Epicureans of the American Association of University Women.

The new home economics building at the University of Wichita is opening for the spring semester. Vivian Rockwood and Katherine Van Kuren contributed many ideas when the architects were planning the ranch-type building.

Margaret Guy, clothing specialist in the Kansas Extension Service, resigned in January to work for her master's degree in clothing at Texas Technological College at Lubbock.

Nora Steg of the Kansas Gas and Electric Company is filling the newly created post of home service consultant in the general office in the Company's new Wichita building and **Mrs. Naneen Ralston** is home service representative in the Wichita division of the same Company.

Lillian Bilbro, a graduate of Northwestern State College at Alva, Oklahoma, is home economist at the Gas Service Company in Wichita.

MASSACHUSETTS. An all-day meeting of the **Eastern Massachusetts Home Economics Association** at Simmons College, Boston, on January 21 included discussion of "New Phases of the School Lunch Program" by John C. Stalker, director of the Massachusetts school lunch program; "A Canadian Home Economist Speaks" by Helen Buik, director of restaurant services, T. Eaton and Company of Canada, Toronto; and a report on the White House Conference on Education and suggestions of some implications for homemaking programs in the schools in the area by John B. Davis, Jr., executive secretary of the New England School Development Council.

An International Night program of the Boston HEIB's on November 16 in the auditorium of the H. A. Johnson Company, Brighton, enabled members and guests to hear about food habits and meal patterns of other countries. Speakers were students from Denmark, India, Israel, and Venezuela who are doing graduate work in the Boston area. Mary Alvord, the Boston HEIB's food and nutrition chairman, and Margaret McPherson, chairman of the Boston HEIB's, were in charge of the international foods program.

MISSISSIPPI. Frances Fortenberry has been appointed specialist in rural electrification in the Mississippi Extension Service, the position formerly held by **Lela Maude Smith,** who has accepted another two-year assignment in Pakistan. After teaching homemaking in public schools, Miss Fortenberry served for several years as home economist with the Mississippi Power and Light Company with headquarters in Jackson. She is president-elect of the Mississippi Home Economics Association.

MISSOURI. A release service to daily and weekly newspapers throughout the state has been instigated under the chairmanship of Mrs. Rose Shanight, home economics teacher at the Eureka (Missouri) High School by the **Missouri Home Economics Association.** Each month a press release on some timely subject is prepared by one of the special committee chairmen and released by the Association's Newsletter editor.

At the district home economics meeting held at Kirksville State Teachers' College on October 7, Mrs. Dale Williams, the former Elsie Kimball, a Kirksville graduate and at one time extension clothing specialist in Iowa, presented a program on demonstration techniques. She showed film strips taken from Iowa State College's WOI-TV program "Let's Make a Dress." A record-breaking attendance of 39 indicated the increase in the number of home economics departments in northeast Missouri.

Myrtle Seabaugh, for many years a teacher of home economics at the Mae Green Junior High School in Cape Girardeau, retired from teaching this year and is continuing to reside in "The Cape."

NEW JERSEY. The home economics department of Douglass College is working on **two projects in home economics education** and making plans for **two projects in human nutrition.**

One project under way is a study of the effectiveness of the home economics curriculum at Douglass. The Johnson Home Economics Interest Inventory will be used as one of the instruments of evaluation, which provide a means of making a study of vocational interests.

A home economics education project at the secondary school level is being developed at the Ewing Township school, in co-operation with the home economics department there. The purpose of this project is to study curriculum construction and desirable educational practices in a school that is typical of many in the state, situated as it is in a rapidly growing community and with the expectation of a constantly increasing enrollment.

One of the nutrition projects, in co-operation with the department of agricultural biochemistry, is to be a study of the interrelationship of protein to vitamin B_6. This co-operative project is a part of the research program on nutritional status being conducted by the Experiment Stations of the Northeast Region.

The second research study in nutrition that is being planned, deals with the calorie requirements of cerebral palsied children. This will be done in co-operation with The Walter D. Matheny School in Peapack, New Jersey. The energy requirements of these children will be investigated through controlled studies of food intakes. Indirect measurements of energy expended for certain activities will also be made and compared with those of normal children doing these same activities. This will aid in setting up diets with appropriate calorie levels that will help to control weight changes in these children and should therefore aid in physical therapy work with them.

NEW YORK. An International Christmas Party was held on December 6 by the New York Home Economists in Business at the Carnegie Endowment International Center. Emily Berckmann, public relations chairman for the New York HEIB's, reports:

Our party was a most festive affair with an international Christmas tree, a United Nations booth where Christmas cards were sold, an international kitchen gadget booth, a booth with international

drinks and toasts, and another with a gift wrapping service. Christmas decorations featured in leading women's magazines were donated by the magazines. During the party the Hunter College Choir sang international Christmas carols. All members and guests brought presents to be distributed to elderly ladies. In addition to Santa Claus, we had a Dutch Sinterklaas and his Moorish helper Zwarte Piet (Black Peter).

NORTH DAKOTA. The 14th annual meeting of the **North Dakota Homemakers Council** was held at North Dakota Agricultural College from December 5 to 7. The Council represents 22,500 women in Homemakers Clubs throughout North Dakota. The program included a report on the state homemakers project, the International Peace Garden.

The home economics scholarships that are provided by the Council and Home Extension Agents Association were awarded this year to Mary Gludt of Killdeer, Janet Christopher of Medina, LaVonne Biel of Lefor, Joyce Idler of Rhame, and Jaqueline Maas of Williston.

The Fargo Adult Homemaking Program has included two new types of activities. The first, a weekly television class, Adventures in Planting, was a series of 12 weekly lessons by Donald Hoag, assistant in horticulture at North Dakota Agricultural College, over the local television station. Those enrolled received supplementary materials. The second activity was monthly get-togethers for the able aged folk in Fargo who were interested in group activities.

Mrs. Kerttu Sihvonen, director of the Helsinki (Finland) College for Home Economics Teachers, visited the School of Home Economics at North Dakota Agricultural College from December 8 to 15. She made her visit as a participant in the foreign leader program of the International Educational Exchange Service of the U.S. Department of State to study and familiarize herself with home economics education procedures.

Donna Wohl, homemaking teacher at Mayville, is president of the North Dakota Vocational Association.

Erlys Mische of Fargo, a senior in the School of Home Economics at North Dakota Agricultural College, won top honors in the 5th annual state Make-It-Yourself-with-Wool Contest. She was awarded an all-expense trip to the national contest in Fort Worth, Texas, in January.

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

Arithmetic, algebra, and geometry are not the only sources of figure problems for the teen-age girl.

Just as important—or more so—is the problem of maintaining her own figure in the not-too-fat, not-too-thin proportions that are just right for her height and build . . . the good figure that helps make her happy and self confident.

Adolescence is the age of fads and fancies—in diet as in dress—and surveys show that the eating habits of many teen-agers rate a poor grade on the mealtime report card. Insufficient milk to supply the calcium necessary for this period of rapid growth . . . too little emphasis on nutrient rich foods such as dairy products, meats, fruits, vegetables . . . too many high-calorie, low-nutrient snacks . . . these are among the faults which research shows to be common in many teen-age diets.

Doctors, nurses, teachers, and parents must help the teen-age girl realize that eating a combination of the protective foods in amounts which meet her energy and nutrient needs will not make her fat . . . but will permit her to be her most attractive, energetic, and interested self . . . help her to keep a trim figure while building health for today's happiness as a pretty girl . . . and tomorrow's happiness as a wife and mother.

A booklet "A Girl and Her Figure" is available which tells teen-agers in an interesting and entertaining fashion just what they should know about gaining and maintaining normal weight . . . it provides a reliable and easy-to-follow guide to help the teen-age girl be figure wise, figure-happy.

This booklet is yours free on request without cost or obligation. Send your name and address to National Dairy Council, 111 N. Canal Street, Chicago 6, Illinois.

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OHIO. Ruth Lehman of Ohio State University and her graduate assistant, Lydia Ann Watkins, are continuing **research on characteristics of home economics teachers:** attitudes toward children, especially in the school room situation.

Mrs. Elaine Knowles Weaver and Velma V. Everhart are co-authors of Research Bulletin 764 of the Ohio Agricultural Experiment Station, **"Work Counter Surface Finishes for Kitchens and Utility Areas,"** which was a subproject under the Farm House Requirements Regional Project. Mary E. Singer is the research assistant on the current study at the University of **"Physiological Responses of Women at Work in the Home."**

Jesse Fischer of the Ohio Agricultural Experiment Station is conducting investigations on the **effects of diet upon the activities of digestive and absorptive enzymes.** A supplementary project is sponsored by the Institute of Nutrition and Food Technology.

"How to Get Your Mrs. Degree" is the theme of the year's programs of the Home Economics Club at Ohio University, all of which are centered around planning a wedding. At the United Nations Week program, a panel of foreign students discussed marriage customs in their countries.

"Family Life" is the subject about which the Notre Dame College Home Economics Club program for the year is revolving. Dorothy Jones, supervisor of home economics in the Cleveland Public Schools, was the speaker at the Club's December meeting.

OKLAHOMA. A research program in family relations and child development is now in progress at Oklahoma A & M College. Henry D. Schalock is serving as half-time research worker in co-operation with the Agricultural Experiment Station. His current project is "Personality Development of Children as Related to Interparental Attitudes." James Walters, who is doing half-time research in the College Research Foundation, is currently working on projects concerned with attitudes toward child guidance.

Carolyn Tredwell, who joined the staff of the food, nutrition, and institution administration department at Oklahoma A & M College on October 1, is assisting with the research in human nutrition.

The department of family relations and child development at Oklahoma A & M College will be hosts to the **Southern Association on Children Under Six** at its annual conference on April 26, 27, and 28 in Stillwater. Mrs. Josephine Hoffer, Association secretary, is program chairman.

John J. MacAllister, recently of Mississippi State College, has joined the Oklahoma A & M faculty as director of the School of Hotel and Restaurant Administration.

Joanna Chapman returned to Oklahoma A & M College at the beginning of the second semester after leave to serve as home economics consultant to the Ministry of Education, Manila, Philippines.

Mrs. Lois Drain, who has been on leave from Oklahoma A & M College for the past two years to serve as an educator with the armed services in England, is doing similar work this year with the American military services in Wiesbaden, Germany.

OREGON. Research in the areas of nutrition, foods, and clothing is in progress at Oregon State College.

Clara Storvick, director of nutrition research, reports that current research

deals with the vitamin requirements of humans and with the relationship of nutrition to the condition of the teeth. Recently published in the *Journal of Nutrition* was a report of the riboflavin metabolism of women on controlled diets.

Andrea Mackey, director of foods research, reports active projects on soft wheat flour, potatoes, taste-testing methods, and fats and oils. A recent development of this laboratory is the "Minute-Mix" cake. Planned especially for the homemaker are these cake recipes that require only one minute of mixing time.

Ida Ingalls, in charge of clothing research, is working in the area of children's garments. In process of publication are the results of a survey on the clothing needs of children in the 7 to 14 year age group.

The first **handbook of the Oregon Home Economics Association** has been completed, reports Mrs. Mabel Mack, handbook chairman. In looseleaf form, it contains information basic to operation of the Association, including duties of officers and committees, calendar for the year, history, constitution and by-laws.

Mrs. Katherine Read, head of the family life and home administration department at Oregon State College, has been elected first vice-president of the National Association for Nursery Education, and **Miriam A. Wiggenhorn,** associate professor of family life at the College, is a member of the board of directors. Both will serve two-year terms.

Sherrill Carlson of Corvallis, a '54 OSC graduate, has joined the editorial staff of Pillsbury Mills in Minneapolis. This past year she took work toward completion of a master's degree in journalism and psychology at the University of Minnesota.

"The Home Economics Story through the Medium of TV" was the subject chosen by Barbara Angell, home economist for KPTV, when she spoke to members of Theta Sigma Phi, national honor fraternity for women in journalism, at their November 2 meeting. The evening's program included a tour of the studio, where Miss Angell's show, "What's Cooking at Home," appears Monday through Fridays.

PENNSYLVANIA. The fall 1955 issue of the Newsletter of the Pennsylvania Home Economics Association lists the following objectives of the Association's recruitment committee, of which Ellen Garber of the Pennsylvania Extension Service is chairman: (1) "Compile a list of the following: costs for the various institutions where home economics is offered, including scholarships and job opportunities; source materials on home economics careers; speakers on recruitment for career days; films, slides, and other visuals that may be used in recruitment." (2) "Provide guidance counselors and personnel directors of industry with the information compiled." (3) "Ask college clubs to encourage college students to assist with recruitment."

WISCONSIN. A one-week workshop in the area of Marriage and the Family, under the direction of Paul Popenoe, director of the American Institute of Family Relations in Los Angeles, will be a high light of the 1956 Summer Session at Stout State College. The workshop will carry credit.

Sotiria Kehri, AHEA's 1955-56 international scholarship student from Greece, arrived at the University of Wisconsin in early February to begin study on her scholarship in which the University is co-operating.

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For Bulletin write Dean of Summer Session, 615 Johnston Hall

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FLASHES FROM OUR ADVERTISERS AND EXHIBITORS

"A Girl and Her Figure" by Ruth M. Leverton, an attractive booklet addressed to the teen-ager, has been released by the National Dairy Council. This booklet sells for 15 cents and may be obtained from Department of Program Service, National Dairy Council, 111 North Canal Street, Chicago 6, Illinois.

The first workshop and conference of the newly formed Maytag home service department, held early this year, brought together home economists from the Maytag field organization across the nation. During the workshop they saw demonstrated all Maytag appliances, including the brand-new All-Fabric automatic washer and matching No-Vent dryer. Co-ordinator of the conference was Mary Margaret Christianson, Maytag home service director, whom AHEA members will remember for her delightful performance in the Melody Maids eye opener at the 1955 annual meeting in Minneapolis.

Campbell Soup Company is now featuring **Swanson Meat Pies.** These include a beef, a chicken, and a turkey pie. Vegetables have been cut to a minimum to make each one an "all meat pie." All three pies boast a crisp, tender crust.

A built-in air-conditioning unit manufactured by the Lewyt Corporation fits virtually flush inside a room and outside the house. The unit, which avoids decoration problems by not extending into the room, can be installed in private homes and apartment houses. In new buildings, a casing is inserted into the structure so that the unit can be slipped into place. In houses already built, the Lewyt unit can be installed by making an opening along any outer wall in which the casing is inserted.

Helen Kirtland has joined the "Live Better Electrically" Program as Consultant–Women's Interests and will be located at 205 West 42d Street, New York City. "Live Better Electrically" is an industry-wide program by electric utility companies to promote the increased use of electricity in the home. Miss Kirtland will work with electric utility, magazine, newspaper, radio, and TV people in developing programs to support the project from the woman's point of view. For the past four years Miss Kirtland has been director of the Home Economics Institute for the Hotpoint Company, Chicago.

A "dream" kitchen is being shown by Admiral Corporation in the Merchandise Mart in Chicago. Highlighting the kitchen, which features a built-in refrigerator, freezer, TV receiver, and air conditioner, is a built-in oven with power-operated cooking surface. At the touch of a button a hideaway four-unit cooking top slides out from beneath the built-in oven. When not in use, the cooking top moves out of sight, leaving a convenient work space available.

Six kitchens and a laundry center are kept busy every day by the Consumer Service Department of General Foods Corporation. Two product kitchens test new products for good flavor, appeal, and easy preparation; the recipe kitchen and baking kitchen develop new dishes and new ideas to fit today's living; the photography kitchen plans and creates dishes to be photographed for consumer booklets, teaching materials, and use on packages; the institution kitchen, staffed by home economists who are experienced dietitians, tests quantity recipes which are sent as a free service to thousands of restaurant, institution, and school lunch managers; the laundry center studies home laundering problems and tests special cleaning aids.

A 16-page teacher's source book on "The Nutritional Contribution of Breakfast Cereals," edited by Clara Mae Taylor, professor of nutrition, Teachers College, Columbia University, plus a cereal and milk 16" x 22" two-color wall chart are now available, free, from Cereal Institute, Inc., 135 S. LaSalle Street, Chicago 3, Illinois.

The number of working wives grew 600,000 in 1955, according to a statement in "Report to the Industry" issued by the Vacuum Cleaner Manufacturers' Association, Cleveland, Ohio. This brings the total to almost 12 million—or 11.4 million, to be exact. The total of unmarried working women, however, is declining. Two reasons given for this are: more single women are going to college and increased marriages have reduced the number of single women in the American population.

Two of the new items featured by Mirro Aluminum Goods Manufacturing Company this year are the **Mirro Bake & Roast Pan** and the **Mirro Colored Snack Sets.** The new roast pan will hold a 22-lb oven-ready turkey or the equivalent. It has a wide rim for easy handling and rounded corners for easy cleaning. The colored snack sets have a Mirro Alumilite finish which makes this set attractive to use and easy to clean. The set consists of a 4-quart bowl in Copper-Tone and four 1-quart bowls in red, gold, blue, and silver. Colors are fused into the metal and will not chip or peel.

"Cleans, rejuvenates color and protects against soil—all in one simple operation" is the description of a new product called "duo-dellay" which contains Du Pont's "Ludox" colloidal silica. Ludox, a result of Du Pont research, forms an invisible dirt-resistant coating on rugs, upholstery, and home furnishings. Ludox fills the open crevices and yarn serrations with a minute colorless, odorless, non-toxic, non-flammable particle which clings tightly to the fiber, and thus stops the entrance of dirt and dust. Vacuuming then becomes completely effective. Duo-dellay, manufactured by the Artloom Carpet Company, is now available nationally in bulk form or in a 22-ounce can for household use.

Appointments in the Medical Specialist Corps of the U.S. Air Force, formerly Women's Medical Specialist Corps, are now also open to men who are qualified in hospital dietetics or physical and occupational therapy.

Know Your Products Quiz. Turn to the following pages for the answers to the quiz questions on page 205. **1**—150. **2**—157. **3**—156. **4**—158. **5**—inside front cover. **6**—back cover. **7**—inside back cover. **8**—154. **9**—223. **10**—155. **11**—159. **12**—218. **13**—149. **14**—152-153. **15**—225.

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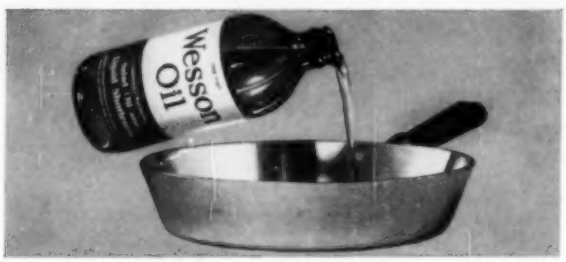

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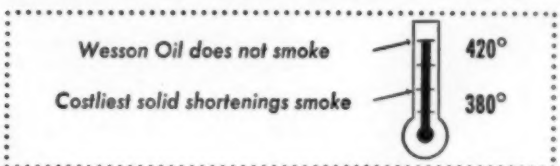

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Recipe

FISH ALMONDINE

- 4 cleaned fish (2 lbs. fresh or frozen) or fish fillets
- 2 tablespoons flour
- 1½ teaspoons salt
- ¼ teaspoon pepper
- ⅓ cup Wesson Oil
- ¼ cup slivered almonds, or other nuts
- 3 tablespoons fresh lemon juice
- 1 tablespoon chopped parsley
- Lemon wedges for garnish

Sprinkle fish with flour seasoned with 1 teaspoon of the salt, ⅛ teaspoon of the pepper. Pan fry in hot Wesson Oil until lightly browned on both sides, about 6 minutes. Remove fish to warm platter. Add remaining salt, pepper and fresh lemon juice to oil in pan. Heat and pour over fish. Brown almonds lightly in pan. Sprinkle over fish; garnish with parsley and lemon wedges. 4 servings.

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